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Agricultural Science—Sandy Soils.

At a meeting of the Farmer's Club held at the American Institute, on the 2d inst., an able essay on soils was presented by Professor S. W. Johnson, of Yale College, New Haven, Conn. The following are some of the views contained in it:—

"The labors of chemists to discover positively all the causes of the fertiliy of soils have not yet met with conclusive success. The mechanical structure of soil is of primary importance. Naked rock grows lichen—the same rock crushed into coarse grains, grows a much higher order of vegetable—pulverized fine, the cereals grow in it. Geology, chemistry, botany, physiology, meteorology, mechanics, hydrodynami s, heat, light and electricity, are all intimately combined in the grand process of vegetation. There are sandy soils in our Eastern States, which, without manure, yield meagre crops of rye and buckwheat; but there are sandy soils in Ohio, which, without manure, yield on an average eighty bushels of Indian corn an acre, and have yielded it for twenty to fifty years in unbroken succession, the ingredients of these soils being, by chemical analysis, the same. At present no difference is known between them, except the coarseness of the particles—the first being coarse, while the Ohio sand is an exceedingly fine powder. The power of soils to attract and imbibe moisture and oxygen was well shown by Schubler, of Hoffen, 40 years ago. Of 13 different soils quartz sand absorbed in thirty days over 1-1000 parts of oxygen and no moisture, while humus absorbed 13 of oxygen and 120 of moisture."

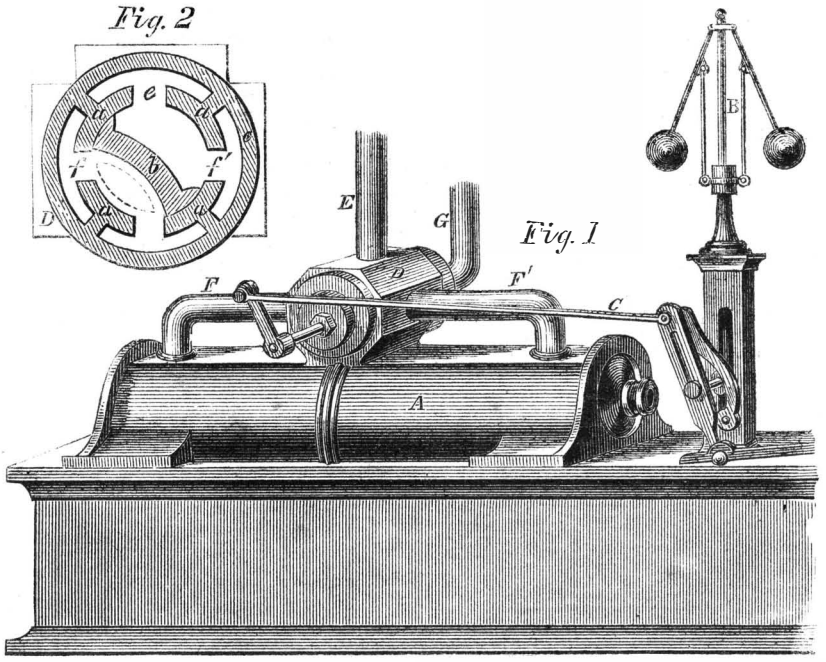
Patent Law Question.

MESSRS. EDITORS—If A, of New York, buys of an inventor in Boston a patent machine, the use of which is confined, by papers signed by both parties, to A's own business in New York, and A exchanges his old machine with the inventor for a new one, and the inventor sends an order on A to B in New York to take possession of the old machine, which B does, and sells it to C, who knows nothing about how B came by it, can C use the machine in New York, or in any other place he chooses, or can the inventor stop it, or is any one liable for damages? M. B.

[The inventor or patentee has the sole right of "making, using, and selling;" therefore C has no right to use the machine which he purchased from B, without the consent of the patentee. Ignorance in the case of purchase is not a valid excuse for the infringement of a patent right.—EDS.

THE lightest substance at present known is hydrogen, which is sixteen times lighter than air, hence it is used to fill balloons.

COMBINATION STEAM VALVE.



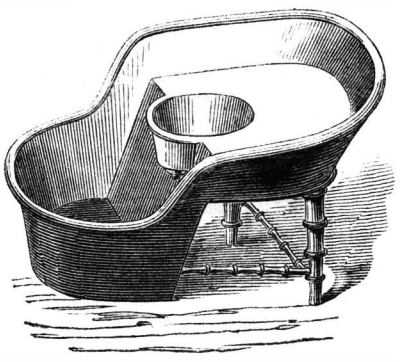
Could the shade of immortal Watt once more revisit the earth, it would feel a sense of satisfaction when contemplating the varied and numerous improvements which have been made to the steam engine since his day, and how greatly steam has been economized by mechanical devices during the past half century. It is our pleasant task to chronicle these improvements, which have, to the true thinker, a deeper meaning than money-making; each improver or simplifier of means to an end, being an aid to progress—a help to civilization. Such an improvement is the combination steam valve invented by Robert Stewart, of Elmira, N. Y., and which is fully explained by the accompanying illustrations. It combines in itself a steam valve, a regulating valve, a graduating cut-off, and a stop valve.

Fig. 1 is a perspective view of the invention applied to a steam engine, A being the cylinder, B the governor, that by means of a slotted piece acts upon the link, C, which is also connected with the eccentric and stem of the valve, thus regulating its motion by the governor. D is the valve, G being the induction pipe, E the exhaust, and F F′ the pipes admitting steam to their respective ends of the cylinder.

The construction of the internal parts are better seen in the cross section, Fig. 2. A shell, *c*, has bearings, *a*, in it, provided with ports, *e f f′*, each of which communicate with their respective pipes, E F F′, and the intervals between the bearings and the shell form steam passages. The valve is seen at *b*; it is placed on a stem, which is connected with C, and the steam finds its way in through an opening in its end, represented by dotted lines. In the position which the valve is placed in, in the section, the steam would be passing to the end, F, of the cylinder, while F′ would be exhausting through the exhaust, E. By placing (with a hand lever or similar means) the valve so as to close both ports, *f f′*, it becomes a stop valve, no steam being then able to pass into the cylinder. The friction is very slight, and there is no hindrance to the steam passing directly to the cylinder from the boiler, as in the ordinary steam chest, and on the whole it is an excellent contrivance.

It was patented September 14th, 1858. The inventor will be happy to furnish any further information upon being addressed as above.

Multum-in-Parvo Bath.



The above illustration, which we transfer from the pages of the London *Artizan*, shows a very simple and exceedingly valuable improvement in the construction of the most important of all domestic conveniences and requisites for health-maintaining purposes—the bath. Cleanliness is said to be next in degree to godliness, and anything which renders the attainment of daily ablution more easy, agreeable. and inexpensive, and more consistant with the economy and arrangement of general domestic life amongst the less wealthy and luxurious classes, should be hailed as a great boon to society at large. The chief cause of this much-to-be-deplored state of bodily uncleanliness is the almost impossibility of any but a wealthy or well-to-do person being able to afford the first cost of a reclining bath, and also that the very large quantity of water requisite renders it difficult to be readily obtained without help, or some other interfering cause steps in to render it difficult, expensive, troublesome, or impossible. The great disadvantage of the ordinary hip bath is, that it does not permit of the feet being immersed simultaneously with the posterior portion of the body, and the position of the bather is not the most favorable for cleansing the upper parts of the person.

This bath is only about the size of, and in appearance externally very much like, the ordinary hip bath, and being quite portable, may be kept in the bed-room or dressing-room; the small quantity of water which is necessary for enabling a complete and thorough cleansing of the person to be performed, renders it capable of almost instantaneous use, independently of any assistance from servants. In using the bath, the bather sits upon the seat, with his feet in the lower part, or foot-bath portion, just as if sitting in an arm chair; the splayed sides prevent splashing over. The seat has a movable pool or dish, which is used as a sponging bath, or a bidet, and which, upon being removed, allows of the lower part, or foot-bath portion, being used as a hip bath; thus this bath combines in one and the same apparatus, a sponging bath, a foot bath, a hip bath, and a bidet; and, by the addition of a pump and the usual poles and fittings, it may also be used as a shower bath. Now, a great domestic convenience such as this, commends itself directly to the serious and immediate attention of every one who values health—and there is no better promoter of bodily health than daily ablutionary exercise—and this is, by this new bath, rendered quite practicable for those to whom it was before absolutely impossible.

Improvement in Steamships.

Although during the past few weeks we have occupied our readers' attention with remarks upon the construction of ships and the preservation of life at sea, and have incidentally made many suggestions upon these important topics, there is still left one idea which has not been touched upon, and which is a very important consideration in case of accident by fire or storm, this is the presence of the machinery. The weight of the engines and boilers of an ocean steamer varies from 300 to 700 tuns weight, and it must be recollected that this is dead weight, interfering with the buoyancy of the ship, and becoming a positive incumbrance the moment it is disabled. By the ingenious method of constructing steamships and placing the machinery invented and patented by Messrs. Salomon & Morris, of this city, the moment the captain discovers that the engine and boilers can be of no more service, they can be let fall into the water, thus lightening the ship in case of storm, and saving the cargo, or in case of fire affording a space into which the passengers can go and remain cool and safe from the ravages of the flames. There are other points in the construction of their boat which also deserve to be noticed, namely, the shape of the guards, and the life-preserving tubes which are secured underneath them, and the admirable method in which the hull is trussed, but we will desist, as it is only our intention to call the attention of practical shipbuilders to the invention.

Tanning Deer Skins.

The method usually practised in preparing deer skins for market is as follows: The skins are placed in a barrel of water with enough ashes to make a weak lye. They remain there until the hair comes off easily with a graining knife, and they are then grained. They are then hung up to dry until hard and flinty, and then they are soaked in rain water with a little soft soap; the water being about blood warm. To dry them wringing is resorted to, and after this process, the wrinkles are pulled out by the hand. They should be next smoked with rotten wood or sawdust, in a long trench for a day or so, the skins being placed loosely in a box or barrel, and again washed in rain water. This process is repeated two or three times and a very well tanned skin is the result.

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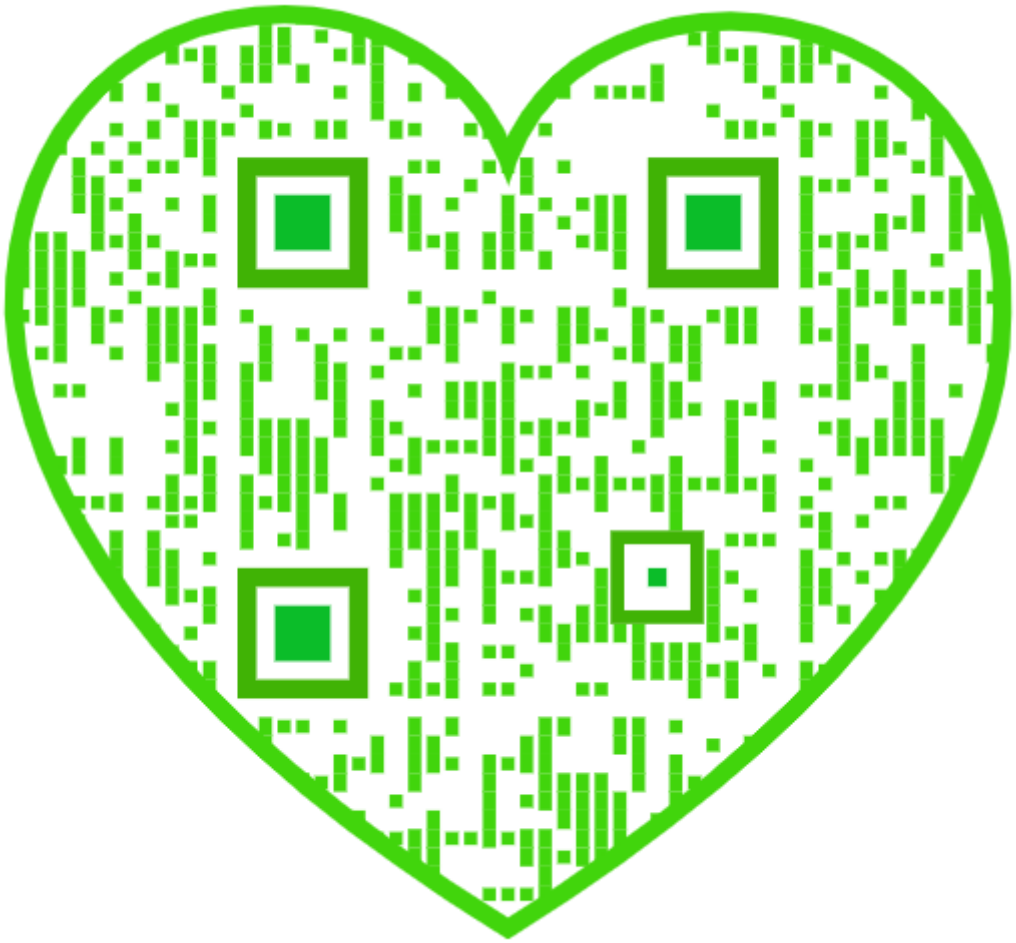

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FOR THE WEEK ENDING NOVEMBER 2, 1858.

[*Reported officially for the Scientific American.*]

*** Circulars giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

METHOD OF HANGING SWORDS—Jonathan Ball, of Utica, N. Y. : I claim the arrangement and combination of the scabbard, D, plate, C, and bit pin, A B, with the belt or sash plate, substantially as and for the purposes shown and described.

MECHANISM FOR TRANSMITTING ROTARY MOTION—Gerard Bancker and Andrew Campbell, of New York City : We claim the use of the combination of the sliding clamping block, G, and extension rod, C, with the double-acting clamping lever, made and operated in the manner and for the purposes set forth.

SAW GUMMER—Nelson Barlow, of New York City : I claim the described arrangement of levers, C and D, rests, E and F, in combination with the milling cutter and clamp, all substantially as set forth.

TRUCKS FOR LOCOMOTIVE ENGINES—Levi Bissell, of New York City : I do not claim a single pair of wheels having a lateral motion, as the same have been proposed for carriages, and also for locomotives, but in such cases they have moved on flat bearing plates, and there was nothing to prevent the truck from maintaining an angular position to the drivers when traveling on a straight line; but by my invention this is prevented, because the inclines, combined and acting as set forth, bring the truck to its proper position, as the engine passes off the curve on to a straight track.

What I claim as an improvement on the aforesaid patent of August 4th, 1857, is, the rigid truck frame, f, attached to the engine by the bolt or pin, h, and receiving one pair of truck wheels, in combination with the double inclined bearings, n o, for the purposes and substantially as specified.

TOOL FOR CHAMFERING LEATHER STRAPS—James Bridger, of Richland, Iowa : I claim the tool described for chamfering and channeling leather straps, as described.

STOVES—J. H. Buchanan, of New Concord, Ohio : I claim the arrangement, consisting of the concave bed or ash pit, A, of larger diameter than the grate. and constructed with supporting lugs or ledges, a a, semi-spherical open top grate or fire chamber, C b b, with draft space, m, existing between it and the ash pit or bed, A, and flaring stove-pipe, D, appearing as a continuation of the grate, and furnished with a transverse feed and draught door, F, and arranged above the fire grate, and made adjustable in a vertical line with the fire grate on a vertical standard, all for the purposes stated, and substantially as set forth.

GATE HINGE—C. E. Burnham, of Binghamton, N. Y. : I claim the pintles, E, placed within the sockets, a a', that are attached to the ends of the gate, A, in connection with inclined planes, d, and steps, e', attached to the posts, B B', the spring, d, acting or bearing on the pintles, c, and the levers j j', or their equivalents, connected to the pintles through the medium of the rods, h, and arms, g, the whole being arranged to operate substantially as shown and described,

[The pintles are fitted in sockets and attached to each end of the gate, and plates with double inclined planes and steps attached are secured to the gate posts; the pintles are acted upon by springs connected to levers, and the whole are arranged so that the gate may be made to swing at either end, the pintles serving in the capacity of both hinges and catches.]

RAKING ATTACHMENT TO HARVESTERS—W. W. Burson, of Yates City, Ill. : I claim, first, The transverse hinging of frame, F', as described, for elevating the rake as it moves to the rear.

Second, Adjusting the rake in its position for starting by the gravity of the gear portion of the raking mechanism, combined with the transverse hanging of the frame, F', the operation being substantially as described.

Third, The combination of the tilting platform, P', stubble leveler, P'', and glancing board, R', with the rake for collecting and delivering the cut product, as specified.

Fourth, The combination of shaft, S, cam wheel, W, spring, l, and slotted step, h, substantially as and for the purpose set forth.

ARITHMOMETER FOR ADDITION—O. L. Castle, of Upper Alton, Ill. : I claim, first, Combining the shaft, D, of the driving wheel, C, which serves to give motion to the register, with the keys, F F, by means of a series of ratchet wheels on the said shaft and a series of levers of different lengths which work on said shaft as a fulcrum, and are connected with the keys, when the whole are arranged as set forth.

Second, Combining the register wheels of lower denomination with those of higher denomination, by means of the pawls, t t, ratchet wheels, s s, and stationary plates, u, the whole applied, arranged and operating substantially as described, for the purpose set forth.

Third, The springs, w w w, with their elastic arms, 13, applied to the register wheels, in combination with the stationary plates, u u u, and their projections, 1414 14, to operate substantially as and for the purpose set forth.

[This invention is intended to simplify the arithmometer which was noticed by us on page 99, Vol. XIII, SCI. AM., and which was re-issued on May 11th last. It is impossible to describe it in a few words, and we can only say that it is a convenient instrument for adding numbers.]

RAILROAD DITCHING MACHINE—William Chadwick and S. J. B. Anderson, of Terre Haute, Ind.: We claim the levers, 2 4 7 and 9, arranged on a car, substantially as described, for holding the scoops at the side of the car, and for adjusting or raising and lowering them, as required.

We also claim the levers, 1 3 5 6 8 and 10, arranged on a railroad car, as described, for operating the scoops so as to catch their load of earth, and for dumping them as dequired.

We also claim the scoops, F F', made as described, so that they may be worked either end forward the same side up, to be filled.

We claim the vibrating mouth piece, x, hinged to the scoop, so as to be vibrated substantially as described.

CAR AXLE BOXES—John W. Cochran, of New York City : I claim, first, The sliding collar, a, constructed and arranged upon the axle, and in relation to the packing of the box, as set forth.

Second, I claim the arrangement of the lubricator, door, disks, packing, follower, and bolts as described, whereby the whole may be adjusted to the bearing brasses, as set forth.

MACHINE FOR CUTTING CORKS—Edward Conroy, of Boston, Mass. : I claim, first, The combination and arrangement of the sliding plate, V, sliding plate and spring or pointers, W, in front of the same, vibrating angular lever, Y, and cams, a a, on inclined revolving shaft, P2. partly cogged wheel, R, and spring arbor or shaft, T, for placing and securing the rough pieces of corks to be cut between the pointed end of the said arbor or shaft, T, and correspondingly pointed revolving hub, U', the whole being constructed and operating substantially as described.

Second, I claim the combination of the cam, K, secured to the top of the frame, A. and curved spring, J, with the sharpening device, G, and rotating cutter plate, H, for sharpening the cutters after they have cut the cork, and are in the act of being again withdrawn, and moved toward the arbor or shaft, T, as described,

Third, I also claim the combination of the cam, o8, and friction roller, b, with the sliding frame, B as set forth.

[This is an improvement, in connection with the rotary cutters and sharpening device, of the machine illustrated on page 364, Vol. XII, SCI. AM. The present invention enables it more effectually to cut the corks, and improves the mechanism which holds the cork while being cut.]

GRAIN SEPARATORS—William R. Cox, of Delphi, Iowa : I am aware that suction blast spouts have been arranged in various ways, and I therefore do not claim, broadly, the separating of dust, chaff, and other light impurities from grain, by subjecting the same to the action of a blast in passing through a spout or spouts.

But I claim the spouts, E F, provided with the deflectors, c d. connected by the trough, I, and arranged relatively in respect to each other, and to the spout, D, and trunk, A, substantially as and for the purpose set forth.

I further claim, in combination with the above, the loaded valve, J, applied to the trunk, A, and used in connection with the spouts, D E F, for the purpose specified.

[In this invention a series of suction blast spouts attached to an inclined trunk communicating with a fan box are employed, the several parts being constructed and arranged in such relation with each other as to separate all dirt, chaff, or foreign substances from the grain very expeditiously. Deflectors are also used, placed within the suction blast spouts, so as to properly present the grain to the action of the blast. A regulating valve is placed in the inclined trunk, to bring the blast under perfect control.]

BANK LOCKS—Lyman Derby, of New York City : First, I claim the use of the bars or cross bars secured on an axis eccentric to its true center, for the purpose of obtaining gravity to unlatch them, in combination with the inside of the door of a safe or other place, substantially as set forth.

Second, I also claim the use of a pendulous latch lever, secured to the inside of a safe, in combination with the bars or cross bars operating as set forth, on the inside of the door of a safe, and for the purposes described.

Third, I also claim the use of the application of a clock-work movement, in combination with an inverted Y-shaped pendulous latch lever and bars or cross bars, on the inside of the door of a safe, for the purposes set forth.

MANUFACTURING STEEL—Joseph Dixon, of Jersey City, N. J. : I claim the process of making steel by heating pig or cast iron, covered or stratified by any substance which will preserve a separation of the plates or pieces of iron through the process of heating, except so far as the use of oxyd of iron as a separating material by any patent referred to.

HARPOON—George Doyle, of Provincetown. Mass. : I claim, first, Attaching the shank of the harpoon to the head, so that when the latter turns in the fish, the flat side instead of the edge shall be presented to the resisting body, substantially as described.

Second, The slots, 3 and 4, and lip, 6, operating substantially as set forth and for the object specified.

TACKLE BLOCKS—John Ferrier, of Charlestown, Mass. : I claim placing two rows of pulleys, C D, in each block, the axis, a. of one row being at right angles to the axis, b, of the other, and the rope passed or adjusted around the pulleys, as and for the purpose set forth.

[The block of this arrangement of tackle is made with two rows or series of pulleys, one placed above the other, with their axes at right angles to each other. By this device a greater number of pulleys can be placed in a block of less cumbersome dimensions than usual, friction is greatly diminished, and a very efficient and powerful block is obtained.]

GASFITTER'S VISE—Joseph S. Ford, of Philadelphia, Pa.: I claim the upper die, D, and lower die, J, in combination with the screws, H H', the said dies having two or more semi-circular recesses, situated in respect to each other and to the screws substantially as and for the purpose set forth.

CAR SPRINGS—Perry G. Gardiner, of New York City: I claim as my invention the following named improvements and features in the conical coiled steel spring, viz:—

First, Its construction out of a plate or bar as described, not thinned, slotted, or hammered out at the ends, which is to constitute the apex of the spring.

Second, Nicking or compressing the face of the plate (as shown at the line) without breaking or cutting the fiber of the metal, for the purpose described.

PLOWS—John Gehr, of College of St. James, Md. : I claim the hollow corrugated roller, a, in combination with the mold board, c, brace, g, and guard, f, the whole being constructed and arranged substantially in the manner and for the purposes set forth.

STRAW CUTTERS—Oliver C. Green, of Dublin, Ind.: I claim the described arrangement of the hinged connecting rod, P, lever, G, spring, H, pin, I, sliding gate, D, and oblique knife, E, with the V-shaped knives, b, at the end of the trough, B, for the purpose set forth.

JOINT FOR T-RAILS—Wm. Harvey, of Albany, N. Y.: I do not claim the invention of a plate, which like the plate, C, stands flush with the face of the rails at the joint, to serve as a bearing for the wheels in passing the joint, as I am aware that numerous different modes of applying such plates have been proposed, neither do I claim generally the use of side clamping plates.

But I claim the arrangement and combination of the laterally tongued side plate D, with the rails, A, chair, B, and side piece, C, as and for the purposes shown and described.

[Two side plates are secured one on each side of the joint, the one on the outside serving as a continuous bearing for the wheels at the joint. These are combined with a chair that differs very slightly or not at all from those in common use, and the side plates not only lock the rails together both laterally and vertically at the joints, but also prevent the working or drawing out of the spikes which secure the joint chair to the tie.]

RAILROAD CHAIRS—P. F. Hall, of Troy, N. Y. : I claim the combination of the plates, b b c. and lips or jaws, a and c, together with the draw bore spiking of the same, by which they are keyed and also wedged and fastened to the tie by one operation, all as specified and for the several purposes set forth.

SEEDING MACHINES—Aaron Hatfield, of Petersburg, Ill. : I claim the arrangement of the seed hoppers represented, in combination with the mechanism for driving the seed slides and dropping the grain or seeds, and covering them as described and shown.

DRINKING CUP—Louis Grosholz, of Philadelphia, Pa.: I do not desire to confine myself to the employment of three sections, inasmuch as two might be used for a small sized cup, and for those of a larger size, four or five sections might be advantageously employed.

But I claim as a new and improved article of manufacture, a drinking cup formed of two or more sections with inclined sides, said sections being adapted to, and detachable from, each other, substantially as set forth and for the purpose specified.

SEEDING MACHINES—Wm. Y. Henry, of Monmouth, Ill. : I do not claim the markers or weights, h h, for they have been previously used.

But I claim connecting or arranging the levers or rods, M M, of the pestles or weights, h, and the levers, I, of the tubes, H, substantially as shown, when used in combination with the wheel, i, connected with the slide, Q, and the whole arranged to operate as and for the purpose set forth.

[This is an improvement in seeding machines designed for planting seed in check rows; it consists in the employment of devices whereby the distributing apparatus, markers and shares are all placed under the control of the driver.]

TAP FOR CUTTING WOODEN SCREWS—W. O. Hickok, of Harrisburg, Pa.: I do not claim a hollow cylindrical projection at the cutting end of a tap, nor the throats leading from beneath the cutters into the same.

But I claim making screw threads, d d, around the outer surface or periphery of the cylindrical projection, h so that they shall operate in the manner and for the purpose described, the said projection, b, being made slightly larger than the hole in the wood in which the required screw is to be cut, for the purpose described.

DIE FOR CUTTING WOODEN SCREWS—W. O. Hickok, of Harrisburg, Pa. : I do not claim the arrangement of two cutters, in combination with the lower die, so as to cause the one to commence, and the other to finish, the groove which produces the thread upon the cylinder of wood operated upon, as this arrangement and combination is well known.

But I claim the reduced sectional thread, k, in combination with the first cutter, C, when the same is made to operate in the manner and for the purpose set forth and described.

IMPROVED LOCK AND KEY—Joseph Hoffacker, of New York City : I claim, first, Constructing a lock which is closed or locked by the bolt shooting forward and upward, and which is opened or unlocked by a screw key urging the bolt downward and backward, substantially as described.

Second, The construction of the bolt in combination with the barrel and the three springs substantially as described.

Third, The combination of the door handles with the lever, substantially as described.

Fourth, The construction and operation of the screw key, substantially as described.

THRESHING MACHINES—Abram Jackson, of Lebanon, Tenn. : I am aware that threshers and winnowers have been mounted upon wheels like those of a common wagon; the traveling wheels operating as driving wheels operating as driving wheels to the other machinery. In such cases the wheels are usually made and sold as part of the thresher and winnower, and I believe no thresher and winnower has been heretofore constructed so as to be readily used upon a common farm wagon.

I do not broadly claim the mechanical devices above described, but limit myself to their new results as contributing to make substantial improvements in harvesters.

I claim the arrangement of the band wheels, D, upon the spokes of the wagon wheels in connection with the hounds, F, substantially as described for the purposes set forth.

FILTERING COCK—Lemuel P. Jenks, of Boston, Mass., and Francis Draper, of East Cambridge, Mass. : We do not claim the reversal of the filter to change the current, nor the reversion of the vessel containing the filtrating portion of the filter, nor the purifying the filter by means of the specific gravity of a small portion of water left behind after the full current has ceased.

We do not claim the alternate transmission of the water from one side to the other in filtering cocks, nor do we claim that device in combination with the optional passage of liquid through the case without passing through the filter.

Nor do we claim the alternate transmission of the water by one passage across the width of the filter.

But we claim the combination and arrangement of a filtering cock substantially as described, giving the optional transmission of the water through the filtering medium in either direction, or through the filtering case, the former without unnecessary impediment to the current, by one passage across the width of the filter from a rotating two-way cock placed by the side of the filtering medium and closed or discharging at pleasure, the filtering case and the filtering medium being stationary.

SAUSAGE MACHINE—R. V. Jones, of Johnstown, Pa. : I claim the arrangement of flanged cylinder, B, with a knife, D, having hooked or V-shaped teeth, substantially as and for the purpose specified.

SHIELD PINS—Josee Johnson, of New York City : I do not claim making a shield pin of one piece of wire, as that has been done before.

But I claim shielding the point of the pin within folds or coils when turned on both sides the main stem as described at B, in Figs. 1, 2 and 3, and at C, in Figs. 5, 6 and 7.

CAR SEATS—P. P. Joseff, of Philadelphia, Pa. : I claim the combination and arrangement of the slotted vertical bar, E, having grooved wheels, K, on its face, cogged plate, E, pinions, D r'', radial arm, D', and wrist pin or stud, C, projecting from the end of the movable seat bottom, A', and jointed crank, G, substantially in the manner described.

[In this invention the reversible backs of the seats are raised to a horizontal position with their edges next each other, and the hinged bottoms of the seats are turned over and brought into the same horizontal line as the seats, but filling up the space between the permanent portions, so as to form a series of couches in a very expeditious manner. There are also a number of ingenious mechanical means by which this change is effected, and the parts secured in their position.]

SASH FASTENER—Edward M. Judd, of New Britain, Conn. : I do not claim a sash-fastening formed by attaching a pintle to the end of a flat steel or metal spring, which is secured to the edge of the stile of the sash, and having a rod attached thereto, and passing through the stile of the sash for the purpose of withdrawing the pintle from the holes in the case or framing, for such is an old and well-known fastening.

But I claim attaching the rod, D, to the spring, B, by means of the grooves, a', in said rod, the button a'', at its end, and the hole, b, and slot, c, in the spring, B, substantially as and for the purpose set forco.

[This is an improvement in that kind of sash fastenings in which a pintle is attached to a flat spring, the spring being secured to the edge of the sash at one side, and the pintle fitting in holes in the stiles of the frame or case. The object of the invention is to facilitate the application of the fastening to the sash, and render it more efficient in its operation than usual.]

SEEDING MACHINES—H. Kaller, of Perry, Ill. : I do not claim providing the wheels, B, with concave peripheries for that has been previously done to effect the purpose stated. Neither do I claim the marker, N, attached to the reversible bar or rod, M.

But I claim the cylinders, I I, provided with the seed cells, d', having the slides, e, attached and arranged within the tubes, F, and relatively with the hoppers, H, to operate as and for the purpose set forth.

[A peculiar seed-distributing device is employed in this invention, and it is so arranged that a very efficient seeding machine is obtained, and one that may he easily operated.]

STRAW CUTTERS—James Lashbrooks, of Rockport, Ind. : I do not claim, separately, any of the parts.

But I claim the two rollers, B B, provided with the circular toothed blades, C, in combination with the clearers, b, the whole being arranged to operate as and for the purpose set forth.

[This invention consists in placing a series of toothed circular blades on parallel rollers fitted within a hopper, the blades being arranged relatively with each other and with clearing prongs, whereby the desired work may be done with great facility without choking or clogging.]

MINERS' RAILROAD TURN OR CIRCULAR SWITCH—E. B. Lowman, of Bellair, Ohio : I claim the arrangement of the crossings, as seen at letters C D E F M N & L in Fig. 1, together with its adaptation to the working of miners on either side of the entry by reversing its position on the main stem.

MACHINE FOR SOLDERING—E. Manley, of Marion, N. Y. : I claim arranging within and in the desired relation to the furnace, A, mounted on wheels, G, and constructed as set forth, an inclined copper bar or soldering tool, I, having notches on its lower surface and a wedge or key, J, above, for retaining it with the required degree of heat, in combination with the inclined conducting tube, L, and hinged box, M, and its attachments divided into two compartments for the solder scraps and resin, the whole being constructed and operating substantially as described.

[A suitable furnace is supported on a pair of wheels, and through it is passed an inclined copper bar or soldering tool, having a wooden handle on one end, and being bent and rounded like an ordinary soldering tool on the other. With this is combined a tube bent upward that catches all the bits of solder, resin, &c., that drop off as the apparatus moves along over the metal being soldered.]

SMOKING TUBE—Charles Matthews, of New York City : I claim arranging the tubes, C and E, with the mouth-piece, D, in such relation to each other that they form a compound smoking tube for smoking obacco or other substances in a finely divided state, the whole being conserructed and arranged as specified.

And I also claim closing the upper end of the tube, E, in such a manner that the same when inserted into the draught tube, C, and brought close up to the inner end of the mouth-piece, D, leaves a sufficient space for the passage of the smoke up through the central opening of the mouth-piece described,

And I further claim constructing an ash-pan in such a manner that the same slides on the compound smoking tube by means of a loop, H, so that the ashes dropping from the lighted end of the tube are deposited in the ash-pan, substantially as specified.

[This invention consists of two tubes of thin paper, one of which fits into the other, with barely space between for the passage of the smoke. The inner tube is closed at the bottom by an oblong piece of stiff paper bent over its end in the shape of the letter, U, and contains the substance to be smoked in a state of fine powder. A firm and thick paper tube, from 1¾ to 2 inches long, is fitted into one end of the outer tube, to serve as a mouth-piece, and also as a support for the inner tube —of which the closed end reaches and is fastened to it but so as not to close it (viz., the mouth-piece) entirely; the curved form of the end of the inner tube permitting the smoke to pass freely on either side of it. This compound tube, when filled, is twisted to a tapering end, which, when used, is inserted into the collar of the ash-pan, which is an oblong dish, or pan, about 2½ inches long, of very light metal, in the form of a trough, having at one end a collar or loop of proper diameter and half an inch long. The object of this pan is to catch the ashes, and as the cigar burns away, the pan is made to slide along towards the mouth of the smoker.]

PLOWS—A. A. McMahen, of Oxford, Miss. : I claim, in combination with a colter having a brace and adjusting openings therein, a mold board whose shank is made adjustable in the beam, so that said moldboard may be adjusted to the colter and in the beam as described, the whole being combined and arranged in the manner and for the purpose set forth.

PRESSES FOR EMBOSSING AND FIGURING VELVETS, &c. —John Nagele, of Altoona, Pa. : I claim, first, The application of steam to presses for figuring silks, velvets, and similar materials, substantially as described.

Second, The combination of rollers, A B B C, with the wheels, r r, and chain, z.

Third, The double lever, H H, in combination with the chain, H, and weight, W.

Fourth, The movable guide, N, in combination with the rollers, all in the manner and for the purpose, substantially as described.

REFRIGERATOR—Benj. M. Nyce, of Kingston, Ind.: I claim, first, The employment of the fan, K, when arranged as set forth, for producing a circulation of the contained air, so as to bring it in immediate contact with the lime or other dessicating composition for the purposes specially set forth.

Second, I claim the peculiar construction of the beam, T, that is to say, I claim the metal bar, x, the insulating beam, v, the trough, y, and supporting beam U, all arranged for the purposes and in the manner described.

Third, I claim the partition, O, when arranged and operating substantially in the manner and for the purposes set forth.

TRAP FOR ANIMALS—R. L. Payne, of Halifax, Va. : I claim the arrangement of the separate balanced fingers C, in connection with the box or body of the trap, substantially as described and for the purpose set forth.

TRIPPING BLOCK FOR BOAT DAVITS—Charles Perley, of New York City : I do not claim a link and lug, as the same have heretofore been used in cable stoppers, but in that instance the apparatus was a fixture, and not adapted to a hoisting or lowering device, and in applying the same to the present purposes new and very useful results are attained.

I claim the tripping or disconnecting block, constructed substantially as specified and applied to davit blocks for boats or to other purposes, as set forth,

METHOD OF ADJUSTING THE PLUMMET WITHOUT MOVING THE TRIPOD IN SURVEYING INSTRUMENTS—Charles A. Saxe, of Philadelphia, Pa. : I claim the arrangement described for placing surveying instruments' centers over any point within the circle, K, without moving the legs of the instrument. and unscrewing the leveling screws, but by unscrewing the screws, C C, moving the ball plate, A, and revolving the ring, H, as described.

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HAND PRINTING PRESSES—J. N. Phelps, of New York City: I claim, first, The combination and arrangement of the radial pins, T, on the transverse shaft and shoulder cams, s, on the sides of the lever, N, oscillating arms, J, spiral springs, U, for moving the same automatically, and spiral springs, M, for pressing the inking roller in contact with the printing rollers, Q R, when receiving the ink from the same, and in contact with the face of the type in the form secured to the under part of the platen, G, substantially in the manner and for the purpose described.

Second, I claim arranging the inking rollers, Q R, in the relation to each other and to the inking roller, K, at the lower end of the bars or arms, J, and the lower surface of the platen, G, when raised as described, and in combination therewith.

Third, I claim the segmental shield or plate, P, so arranged in relation to them and the corresponding segmental formed arm or support, C, as to thoroughly protect the sheets of paper being imprinted, from contact with the said inking rollers, and enable its edges to be moved upward in the space between the shield or plate, P, and arm or support, C, substantially in the manner as described.

LIFTING HANDLES—Joseph B. Sargent, of New Britain, Conn.: I am aware that handles have been made with projections similar to D D, for the purpose of striking on the plate, to prevent the handle from being raised above its proper position when in use.

I therefore do not claim as my invention the projections, D D, nor their striking on the plate.

But I claim "a lifting handle" with the plate cast in any metal that can be bent, having the socket formed in the manner described, and operating in connection with the handle, as specified, the whole being an improved article of manufacture.

HEMP BRAKES—William Shelby, of Waverly, Mo.: I do not claim, broadly, the invention of reciprocating beaters or blades for hemp machines.

But I claim the arrangement of the beaters or blades, I J, at varying distances, in combination with the yielding plates, K, as and for the purposes shown and described.

[In this hemp brake a series of reciprocating beaters are employed, operating or working between stationary blades placed in oblique position relatively with the reciprocating beaters, and consecutively in a reverse position relatively with each other. These parts are used in connection with elastic plates, so that hemp or flax may be thoroughly operated upon, the woody portion being first broken, and then detached or separated from the fibrous portion.]

COMBINED BOOK AND SLATE—Forrest Shepherd, of New Haven, Conn.: I am aware that slates have been used in books, where it was necessary to turn back and forth from one to the other, which in general is attended with more inconvenience than where the two are used separately. I therefore do not claim that arrangement as such as my invention.

But I claim the combination of the slate with the book, when so connected and arranged that the slate can be used with equal convenience and facility with each page of the book, while the page and the slate are continually before the eye of the user, as represented in Fig. 1, and the whole is constructed and connected substantially as described.

CAR SEATS—John W. Sibbet, of Cincinnati, Ohio: I claim constructing every alternate seat in two distinct parts, and providing the upper detachable portions, A', with guiding hubs, L, at their ends, to which are attached straps or bands, K, for elevating them, horizontal spring bars, N, whose ends enter slots, J, in the guide columns or posts, I, for sustaining them, in conjunction with the straps or bands, K, in their elevated portions, A', and combining with the said upper detachable portions, A', and the permanent seats, A, pieces of cushioned or stuffed cloth, Q, or other material, capable of being packed in the boxes, b, of the seats, the whole being constructed, arranged and operated substantially as described.

[Every alternate seat in the car is made in two parts, and the upper portions are provided with means for elevating and sustaining them in a horizontal plane between the permanent seats and the roof of the car. The upper portions and lower permanent seats are provided with cushioned canvass, or other sacking cloth, so that they can form beds upon the frames, and accommodate as many persons laying down as in a sitting posture.]

RAILROAD CHAIRS—James H. Simmons, of Painted Post, N. Y.: I claim the construction of a chair raised in the center for the ends of the rails to rest on, as shown at c c, and sloping from near the center toward each end of the chair, leaving a space between the rails and the chair over the sloped portion, to accommodate the spring of the rails, together with projections, V V, as described.

CANDLESTICKS, &c.—Samuel Slocumb, of Cambridge, Mass.: I claim as a new article of manufacture, a lamp stand having a metal socket, a glass shank, and a marble base, the whole being secured together by the rod, D, as set forth.

PREPARING WOOL AND OTHER FIBERS FOR SPINNING—Waterman Smith, of Manchester, N. H.: I claim, in the process of drawing wool and other fibrous substances, heating the sliver of wool, or other substance, and keeping it hot while it is being drawn, by passing it over or against, and in contact with, heated surfaces, either moving or stationary, substantially as described, for the purposes set forth.

MACHINE FOR CREASING AND BLACKING LEATHER FOR HARNESS—Adolph Stempel, of Oquaroka, Ill.: I do not claim, broadly, the employment or use of creasing and embossing rollers, in connection with a pressure roller, for ornamenting and creasing leather, for such device has been previously used.

But I claim the pressure roller, F, and the creasing and embossing rollers, i, in combination with the color fountains, K L, and felt rolls, M M, the whole being arranged to operate as and for the purpose set forth.

[By the employment of creasing and embossing rollers and a pressure roller combined, leather straps of various widths may be creased and embossed. In connection with these there are also two color fountains and felt distributors, so placed as to color the edges of the strap simultaneously with the operation of embossing.]

PEDAL ATTACHMENT FOR PIANOS—William B. Stetson, of Taylor, N. Y.: I claim the construction and arrangement of the pedal chord bars, b b b, connecting suspension rods, c c c c c c, and upper bars, f f f, and finger rods, i i i i i i, and operated as described in combination with key-board instruments, and whereby the corresponding harmony of any melody or air is produced simultaneously therewith by the performer, through the agency of the feet, substantially as set forth.

SAFETY APPARATUS FOR STEAM BOILERS—Francis Stebbins, of Hinsdale, N. H.: I am aware that it is not new to so combine a vessel with a boiler and an alarm or signal apparatus, that such vessel, when the water in the boiler may be above its lowest safe water level, shall be kept filled with water by the pressure of the steam, and when such water may fall below such level of safety, such vessel, by the entrance of steam into it, shall be emptied of its water and thereby, by the abstraction of the weight of water from such vessel, the alarm or signal apparatus shall be put in operation, and therefore I do not claim such. Although I maintain this principle of operation in carrying out my invention, I effect an important and valuable improvement, as my invention rests on an improved mode or means of carrying out such principle, and consists in an arrangement of pipes with respect to the vessel and boiler, whereby the steam and water passages are entirely separate from one another, so that the water does not hinder or obstruct the passage of the steam from the boiler to the vessel, D, one not having to rush directly by and in contact with the other, while the steam may be flowing into the vessel, D, of the safety apparatus. Furthermore, my arrangement presents other advantages, as by means of it the safety apparatus is entirely out of the boiler, and is not liable to be injuriously affected by the foaming of the water in the boiler.

I claim the improved safety apparatus as specified, or the above described arrangement of the two separate steam pipes, f h, the two separate water pipes, g i, and tubular shaft, a, together and with respect to the boiler, A, the vessel, D, and its loaded level, C, and so as to enable the whole to operate substantially in manner as explained.

SPEED INDICATOR AND RECORDER FOR RAILROAD CARS—J. Dutton Steele and William Lorenzo, of Pottstown, Pa.: We claim the governor shaft and indicator, and the shaft carrying the prepared paper, in combination with the main driver, arranged and operating as described.

HARVESTERS—Charles T. Stetson, of Amherst, Mass.: I claim combining two double-edged cutting blades with each of the vibrating cutter shanks for the purpose of reducing the number of joints in the cutting apparatus, substantially as set forth.

I also claim combining an inwardly extending curved arm, a', with the inner end of the finger bar, when the vibrating end of said arm is made to play between guiding cheeks, or in a guiding groove, and the said inner end of the finger bar is jointed to a vertically sliding head, all substantially in the manner and for the purpose set forth.

LOCK—O. B. Thompson, of Hudson, Ohio: I claim the tumblers, f, and guards, g, constructed and arranged substantially as shown, and placed in such relation with the plate, b, of the bolt tumbler, C, and slides, j, to operate as and for the purpose set forth.

I also claim, in combination with the above parts, the bar, H, arranged substantially as shown, so as to be acted upon by the arbor bit, s, to adjust the tumblers, f, as the bolt, B, is shoved out from the case.

I further claim the plate, l, and buffer, m, placed at the back part of the slide chamber, E, substantially as and for the purpose set forth.

[This invention consists in the use of a series of slotted tumblers and guards peculiarly arranged, and placed in such relation with a bolt tumbler and adjusting lever that a very simple burglar and powder-proof lock is obtained, one that may be cheaply constructed, the tumblers rendered permutable, and no parts liable to get out of order.]

SEEDING MACHINES—Joseph Walton, of Delavan, Wis.: I do not claim the sowing of grain broadcast by centrifugal force, nor combining a sewing machine and a harrow, nor the sowing of two or more kinds of grain at one and the same time.

I claim the rotary disk, B, in combination with the throat, L, the partition, N N, the valve, H I, the finger E, and the grass seed hopper, when the whole are arranged and combined for joint operation as set forth.

CAR BRAKES—J. N. Ward, of Brooklyn, N. Y.: I claim the combination of the pulleys and brakes, together with the mode of operating the same, the whole being constructed and arranged as specified, and for the purposes set forth.

SELF-INKING HAND PRESS—Daniel Zuern and L. L. Bevan, of Shamokin, Pa.: We claim the combination of the arm or lever, G, with the shaft, H, the crank, I, and the vertical revolving shaft, J, and the connection of shaft, J, with the revolving arm, K, thereby accomplishing a double action, viz, first upon the ink roller, D, second upon the movable bed, E, for reception of card or paper to be stamped or printed. By down vertical pressure of lever, A, roller, D, moves horizontally over ink sponge, F, and in contact with it.

We also claim the combination of finger, d, with hook e, on movable bed plate with the mode of adjustment and disconnection, for the purpose of effecting movement of movable bed plate, E, and also the movable bed plate, E, for the purpose substantially as set forth.

But we do not claim any other part or portion of the machine as new, or of our invention.

AXLE BOXES—Henry Howson, (assignor to Isaac P. Wendall and Jacob L. Wendall), of Philadelphia, Pa.: I claim the combination of the box with the bearings, B and B', and retaining keys, C and C', when the interior of the box is arched on the top, when the said arch terminates on each side at the recesses, g g, formed in the sides of the box, when the keys are adapted to fit into the recesses and against the edges of the bearings, and when the several parts are arranged in respect to each other, substantially in the manner and for the purpose set forth.

WEIGHING CARTS—James W. Martin (assignor to Lewis Rothermel), of Philadelphia, Pa.: I do not claim the application of a scale beam to a cart, for the purpose specified, for this has been formerly done, and may be seen in the device patented by me, and formerly alluded to.

But I claim the shaft, E, provided with hooks, d d, and arms, e e, which are connected by rods, f f, with lever, h, having their fulcra, i, connected by pendants, j, to the arms, k, of a shaft, l, which is connected with the scale beam, G, by the arm, o, and rod, a, the rods, q, of the body resting on the lever, h, when the latter raises the body, and the latter provided with the rod, c, for the hooks d, to catch over, the whole being arranged substantially as and for the purpose set forth.

[This is an improvement on a cart previously patented, and illustrated on page 129, Vol. XII, SCI. AM. It consists in an improved mechanism, whereby the cart body may be firmly secured to its bed when necessary, and also readily detached therefrom, and elevated so as to be connected only with the scale beam, for the purpose of having its load weighed.]

PADLOCKS—E. M. Mix and J. E. Mix (assignors to themselves and C. D. Johnson), of Ithaca, N. Y.: We do not claim, separately, the curved tumblers, a, for they or their equivalents have been previously used.

But we claim the combination of the curved or bent tumblers, a, and dog, D, provided respectively with springs, C k, and arranged relatively with the bolt or shackle, B, to operate as and for the purpose set forth.

[In this lock a dog with a series of tumblers are used, so constructed as to render it extremely difficult to pick or open by any instrument except the proper key. The invention is more especially applicable to padlocks, although its use is not confined to them.]

BILLIARD TABLE—Daniel D. Winant, of New York City, assignor to William R. Winant, of Brooklyn, N. Y.: I claim, first, Constructing the beds of billiard tables of slabs of glass, substantially as and for the purposes specified.

Second, I claim the clips, c c, taking the beveled edges of the slab to retain the same, as described and shown.

Third, I claim the block, e, receiving the screws, g, of the cushion rail, as and for the purposes described.

MECHANICAL MOVEMENT—Joseph H. Davis, of Woburn, Mass.: I claim the arrangement set forth for transmitting power from any prime motor to a propelling gear or wheel, viz, through the intervention of a series of curved or bent and weighted arms, said arms working together and connected to the gearing at their ends, substantially in the manner and for the purpose set forth.

RUDDER FOR VESSELS—Silas Yerkes, Jr. (assignor to himself and George Yerkes), of Philadelphia, Pa.: I do not claim, broadly, making a rudder in two parts, and connecting them so as to act simultaneously, but independently of each other.

But I claim the gearing of the outer or aftermost of the two hinged portions of the rudder with a fixed gear or toothed arc attached to the vessel, substantially as and for the purpose specified.

[This rudder is made in two parts, called by the inventor the "main rudder" and "outside rudder." The former is hinged in the same manner as a common rudder, to the stern-post of the vessel, and the other one is hinged in a similar manner to the back of the fast one, and has secured to it a concentric toothed gear, which gears with a stationary toothed arc, concentric with the first one. The main rudder is operated in the usual way, and by its action the outside one is caused, by the arc and gear, to move faster in the same direction, and the two combined produce a greater effect on the water by a given movement of the steering apparatus than a single rudder presenting the same area of surface.]

RE-ISSUES.

MODE OF GENERATING HEAT—T. R. Hartell (assignee of Wm. Hartell and Jos. Lancaster), of Philadelphia, Pa. Patented Nov. 23, 1852: I claim the adaptation of, or rendering available, tar, as a fuel for the production of the intense and steady heat required for the melting of glass and for other processes and manufactures, by introducing water or the vapor of water into a furnace or fire place, in contact, combination with, or in close proximity to the tar, substantially as set forth.

SEWING MACHINES—I. M. Singer and E. Clark (assignees of John Bachelder), of New York City. Patented May 8, 1849: What is claimed is the combination of mechanism substantially such as is described, so that the cloth or fabric to be sewed being placed upon the machine will be automatically fastened on to the feeding apparatus, carried forward to receive the stitches, and discharged from the feeding apparatus, substantially as described, and so that seams of any desired length may conveniently be sewed.

CORN HARVESTERS—E. C. Manck and W. T. McGahey, of Conrad's Store, Va. Patented April 22, 1856: We claim, first, The rotary arms, p, in combination with eccentric guides, q, substantially in the manner and for the purpose specified.

Second, The employment of a double series of cutters, for cutting stalk and stump, as described.

ADDITIONAL IMPROVEMENT.

METHOD OF ATTACHING LAMPS TO LANTERNS—John Fleming, of Pittsburg, Pa. Patented July 6, 1858: I claim the improved arrangement described, the same consisting in the attachment of the spring, D, and clips, E E, to the lamp case, instead of to the lantern as and for the purpose specified.

DESIGN.

STOVES—E. J. Cridge, of Troy, N. Y.

Monster Steam Hammer.

There is at present being constructed in Newcastle-on-Tyne, says the London *Times* of the 4th ult., by Messrs. Morrison & Co., engineers, of that place, a monster steam hammer, ordered by the Russian government. It is the largest ever constructed on the Tyne, and is of most gigantic proportions. It is constructed on the principle of Messrs. Morrison's patent. The hammer bar and piston are forged in one solid mass. The diameter of the bar is thirteen inches, and that of the piston thirty-one inches, and the total weight of this portion of the hammer exceeds five tuns. It was forged by a two-tun hammer of similar construction. The cylinder stands on two frames of three feet in width, and there is a clear working space of fourteen feet between them. The frames arch overhead, and clasp the cylinder, the whole being securely fitted and bolted together, and forming one solid mass. The total hight from the ground to the under side of the frame is nine feet four inches, and the total hight of the hammer itself is eighteen feet, the hammer having a clear fall of six feet. The ingress and egress of the steam is regulated by a double balance piston valve, which is worked by hand, by means of a long lever reaching from the valve to a staging, on which the engine-man stands. The number and force of the blows can be regulated, by means of this valve, to he most astonishing nicety, so great being the command which the workmen have over this immense mass, that it can be arrested in a moment, while in the act of falling. One of the great features of this hammer is the entire absence of all complication in its construction, so great, indeed, that it hardly looks complete as it stands, and it seems impossible that one lever could make various changes of movement and varieties of blows, so necessary to forge work, but this is the case. It is very well suited for the rough work it has to undergo, and is peculiarly adapted to be used in countries where—as in Russia—skilled labor is scarce, as it is almost impossible for any portion of it to get out of repair. The breaking of piston rods and cylinders, so common in other hammers, cannot occur here, as the hammer bar or piston rod is of such enormous dimensions, and is forged solid in the piston, the two combined forming the whole weight of the hammer. This novel machine is just completed, and will, in a few days, be shipped for St. Petersburgh.

Domestic Recipes.

ARTIFICIAL FLOWERS.—The beauty of these imitations of the floral world depends upon the taste and skill of the makers. The delicate fingers of woman and her quick powers of imitation, combined with an exquisite taste for the beautiful in nature, enables her to excel in this branch of art, which at present is carried to the highest pitch of perfection in the French capital. Although all the finest qualities of our artificial flowers are imported, still great quantities of them are manufactured in New York City, and they may be imitated by many females as a domestic recreation affording much pleasure. The materials required for them are velvet and fine cambric for the petals, and taffety for the leaves, with thin whalebone or wire for the stems. These are cut into the proper forms and pasted together with a solution of gum-arabic. The colors to produce the shades are put on with a fine hair pencil in the same manner as drawings are colored and shaded. Carmine is employed to produce the red and pink colors; the yellow is a tincture of turmeric; green of distilled verdigris; blue neutralized sulphate of indigo; and purple a tincture of orchil or logwood and the oxyd of tin. Great care is necessary in the employment of these colors.

TO CLEAN GLOVES.—Lay them on a clean board, and first rub the surface gently with a clean sponge and some camphene, or a mixture of camphene and alcohol. Now dip each glove into a cup containing the camphene, lift it out, squeeze it in the hand, and again rub it gently with the sponge, to take out all the wrinkles. After this gather up the cuff in the hand, and blow into it to puff out the fingers, when it may be hung up with a thread to dry. This operation should not be conducted near to a fire, owing to the inflammable nature of the camphene vapor. The receipts given in all the printed books we have consulted for cleaning gloves are barbarous.

MAHOGANY STAIN—The color of mahogany may be imitated with a strong solution of logwood and fustic put on boiling hot with a brush. The color can be reduced to any depth of shade according to the strength of the liquor employed. After it is quite dry the wood should be varnished and afterwards polished. A varnish made with dragon's blood dissolved in alcohol, and applied in two or three coats will make a very good imitation of mahogany. When dry it should be rubbed down with rottenstone and oil.

ROSEWOOD STAIN.—This is made of a strong solution of logwood and red wood, commonly called *hypernic*. It is put on the wood when hot with a brush, the dark lines being produced by giving two or three coats, and the light shades one. By washing over the surface of this stain with a weak solution of saleratus, it will receive a bluish tinge and appear of a darker shade. When dry, use any kind of varnish for the production of a polished surface.

YELLOW STAIN.—A decoction of turmeric and a little alum, or the grounds of beer and a little sulphuric acid, makes yellow stain on white wood. Dilute nitric acid brushed over white wood, then exposed to the heat of a stove, also makes a yellow stain; this is the most convenient one for imitating maple.

BROWNING GUN BARRELS.—Mix one ounce of nitric acid and four ounces of the sulphate of copper in a pint of water, and apply this to the surface of the barrel, and set it aside to rust for two days. The barrel must now be rubbed with a stiff brush, washed with lime water, dried, and afterwards varnished. It is sometimes necessary to apply two and three coats of the acid solution to obtain a proper coating of oxyd. The lime water neutralizes any free acid that may be left on the iron.

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New Inventions.

Wax Poisons.

Few persons, says an exchange, especially, perhaps, of the very many young ladies who practice the very pleasant art of modeling fruits, flowers, &c., in wax, at all suspect the danger to which they are placed from the poisonous nature of the coloring matter of the wax which they handle so unsuspectingly. The white wax, for instance, contains white lead; the green, copper; the yellow, chrome yellow; the orange, chrome yellow and vermillion—all strong poisons—with many other kinds of wax equally poisonous, and therefore dangerous. Several cases are known in which young ladies have been attacked with partial paralysis of the hands and arms after having devoted some time to the practice of modeling.

Hawkins' Improved Halter.

The straps of halters as now constructed, are very liable to slip around the ring, and so quickly chafe and wear away, thus rendering them quite an item of expense to those who keep horses. The subject of our illustration is designed to remedy this evil, and render the halter more durable, by casting a flanch a little more than a quarter round the ring to which the straps are riveted. The common method of staying the straps from slipping is very imperfect, being an additional or supplementary strap connecting the other two, but as the stitches not only weaken the strap but very often become loose, its effect is very slight.

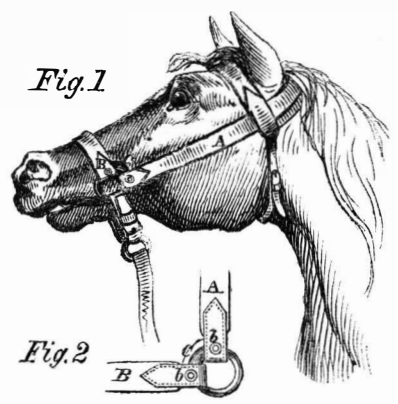


Fig. 1 shows the improved halter on a horse's head, while Fig. 2 fully explains the invention. A B are the two straps, secured by the rivets, *b*, to the flanch, C, of the ring, so that they cannot slip, and irritate the horse or wear themselves out. The ring may, of course, be made of any metal.

This simple, but really valuable improvement, is the invention of Samuel C. Hawkins, of Patchogue, L. I., who will be happy to give any additional particulars. It was patented October 5th, 1858.

New Seeding Machine.

This machine is designed to plant either corn or cotton seed either in hills or drills, and requires only a person to guide it, being automatic in its operation.

Fig. 1 is a perspective view of the machine, A being the seed box, placed on a frame, B, which is supported at its back end by the roller, D. Two handles, E E, are attached to the frame, for the operator to guide the machine with. F is an endless perforated band, which may be constructed of leather, or other suitable material, and which works over two rollers, G G (seen in the section, Fig. 3), placed just below the seed box, and so arranged that as it is moved by a belt from a pulley on the axle of D; each of these perforations carry off enough seed for one deposit, which drops down the conveying spout, H, into the ground. I I are the coverers. *d* is the cut-off, formed of two brushes, that scrapes off any excess of seed that may be on the band, F. In the box, A, is a shaft, J, provided with radial arms, *b*, and as the machine moves along, this is oscillated by the crank, *c*, on which it is placed, which receives its motion from a connecting rod, K, and crank, *a*, on the axis of D. This continually oscillating in among the seed, acts as a stirrer, and prevents the seed from clogging, or becoming matted together. Inside the seed box is a plate, L, which, as the seed gets lower, can be placed in the position shown by the dotted lines, so that it reduces the size of the box, and so keeps the seed always spread upon the bottom, and fills the perforations in the endless band.

KEIPER & FOX'S SEEDING MACHINE.

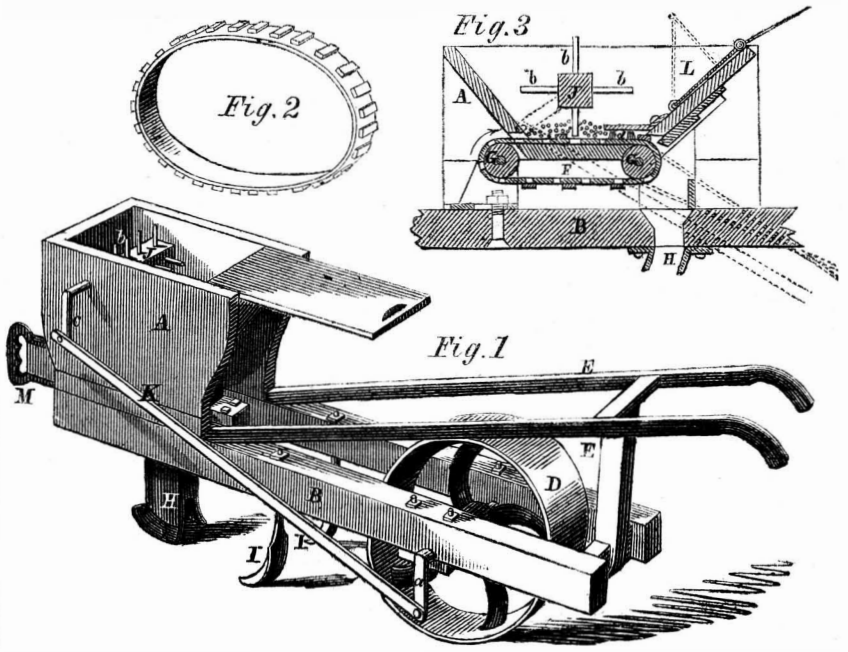
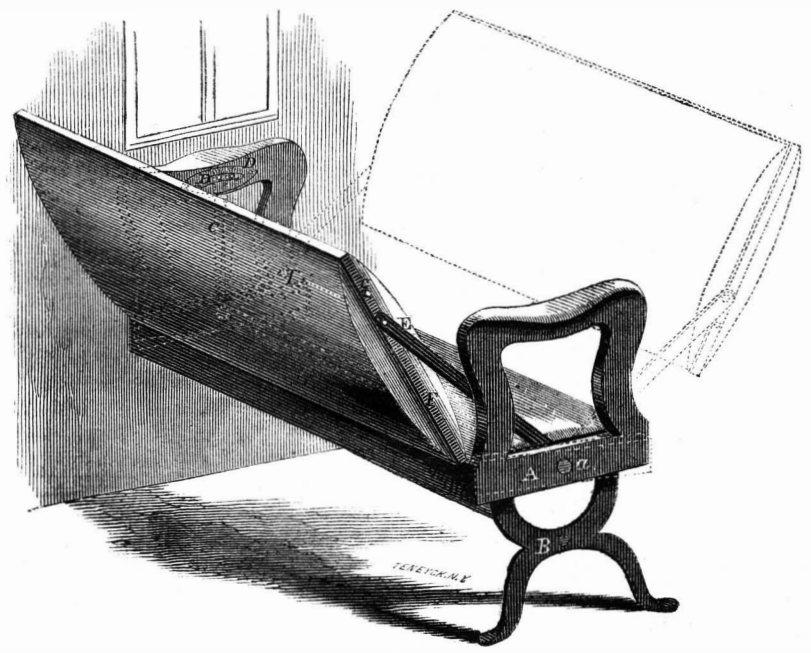


Fig. 2 represents the band which is used for cotton seed instead of F, the transfer of the one for the other upon the rollers, G, can be made very quickly and by any one. These endless bands are not affected by moisture, like wood, and will plant damp seed equally as well as dry, which is a very important feature for cotton seed. The animal which is to draw it is attached to the link, M.

It is the invention of A. C. Fox, of Texana, Jackson county, Texas, and D. B. Keiper, of Easton, Pa., either of whom may be addressed for further particulars. It was patented August 24th, 1858.

PAINTER'S CAR SEAT.



The railroad companies are, we are happy to say, learning common sense gradually, although slowly, and, one by one, directors are beginning to see that attention to the comfort of passengers is an essential element in the increase of dividends. The improved car seats capable of being transformed into a couch or berth for night traveling, and to which subject we first directed the attention of inventors generally as a field for the exercise of their their genius, is becoming extensively adopted, and we are about to describe one of them, which is possessed of many distinctive features and peculiar merits. Any ordinary car seat can be altered to this plan very easily and they are no more complicated than the reversible seats now in use.

The seat may be suspended by a link, C, that by a pin, D′, hooks into a slotted piece, D, in the side of the car, and by a center, *a*, in the side rail, A, or may be supported upon a center on the legs, B, and side of the car, so as to form such an angle whichever side the back be placed, as to give the most comfortable seat. When used as a seat, the back, F, with its cushions, I, is held in its position by the bar, E, and when used as a couch the back is turned over until the pivot or stop, G, comes in contact with E, and F rests against a small stop on the inside of the rail, and it assumes the position shown by the dotted lines.

It is evident that this arrangement will form a seat or couch, so that the occupant can face either direction, and any person can perform the alteration from one to the other with as much ease as they would reverse an ordinary seat. This simple and ingenious contrivance is the invention of Wm. Painter, Wilmington, Del., who will furnish any more desired particulars. It was patented August 31st, 1858.

"It should ever be the aim of man," says an ancient sage, "to understand all old truths, and endeavor to develop new."

Measuring Rules made by Machinery.

A novel machine has just been patented by Dr. Church, of Birmingham, England, for making measuring rules. The description of it, as given in an English journal, reminds us of the famous mutton mills for making sausages. A sheep is thrown into a hopper, a momentary pause, and out comes the delicious morsel. This new machine requires only to be fed with the raw material (boxwood), and in the end delivers perfect rules. The wood to be operated upon is inserted in a clamp, and the machine connected with the driving power; then comes a whirring sound, a shower of boxwood dust, a momentary silence, and out comes a rule, so beautifully made that one is almost bewildered. But we examine the machine, says the editor with due gravity, and after a little exertion, succeed in following its motions. As we watch it we observe cutters one and two march forward, and in a desperate hurry cut off the ends; they return, and cutters three and four rise up like the ghosts from a stage trap-door. They have scarcely come up when they go down again, as though they only came just to show themselves. But they gave a slight hiss before disappearing, and we see they have left their impress on the edge of the rule side. They have cut away the recesses for the steady pin plates. The clamp holding the rule side now begins to move. It turns upon one end as a center, and makes a quarter of a revolution in a horizontal plane. The moment it begins to move, a fussy little cutter begins a series of jerking motions, as though it were snapping angrily at the end of the clamp for moving. But clamp stops in its stately motion, and cutter stops in its fussy motion, and we find that their joint motions were a conspiracy to form the different shapes at the end of the rule side, necessary for the insertion of the metal joint. In short, almost before one is aware that the strip of wood is securely fixed in the machine, the work is done.

It would weary our readers if we described the many machines which Dr. Church's patent embraces. We must content ourselves with stating that there is a machine for making the joint plates; a machine for drilling the holes in the joint plates, in the steady-pin plates, and in the tips; a machine for riveting the several pins by which joint steady-pin plates and tips are fixed on the rule; a machine for dividing or graduating the rule, and several others. Indeed, there appear to be machines for doing everything in the manufacture of measuring rules except growing the wood or ivory, and smelting the brass; and after what we witnessed, our astonishment could scarcely have been increased had the doctor introduced us to machines which, at the word of command, poured forth these "raw materials."

Paddle Wheel and Screw.

A steamer called the *Malta* belonging to the Peninsular and Oriental Company has recently been transformed from a paddle-wheel into a screw propeller by Mr. Laird of Birkenhead, England, and with a decided improvement in speed. The engines of 500 horse power built by R. Napier were retained, but new boilers were put in, and she was lengthened from 209 to 285 feet. As a paddle-wheel steamer, the speed of this vessel was but 9 miles per hour, but as a propeller her speed is 12 knots per hour. This affords some positive proof that the screw is the prince of propelling devices.

Preserving Wine.

Sulphur is sometimes placed in the bottles or casks containing wine, to preserve it, and often in such large quantities as to give it an unpleasant flavor. Should this sulphur contain arsenic, as it often does, in small quantities not enough to poison, it gives the partaker aches and pains for which he cannot account. Cloves, cinnamon, lavender, thyme and other aromatic substances are used to destroy the taste, but all artificially flavored wines should be carefully avoided, as they are usually added to disguise something either dangerous or nauseous.

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Scientific American.

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A Case of Medical Jurisprudence.

It is seldom that we indulge in any comments upon judicial proceedings, but when the evidence upon which human life is to be sacrificed or spared is of a scientific character, it comes within our province to examine the testimony by the laws of investigation and deduction which should lead the scientific man to his conclusions, and see if all the accidental or attendant circumstances have been properly weighed before giving his professional *dictum* on the one side or the other.

An accusing conscience, the vigilance of the executors of the law, the speed of electricity, the precision of physiological formation, the daguerreotyping retina, and the rich fruits of chemical research all conspire in refusing to let the murderer go unpunished. The chief of these accusers, however, is found in the later triumphs of chemistry, yet the test, although generally positive, is at times so delicate as to be in great danger of abuse from morbid excitement and hasty conclusions. A prisoner is now confined in our city awaiting trial for the murder of his wife by arsenical poisoning, against whom there seems to be such strong circumstantial evidence, that every opposing circumstance of justifiable bearing ought to be adduced for the benefit of the accused. The supposed victim, who died nearly a year ago, has recently been exhumed; her body was found in a remarkable state of preservation, and a justly celebrated chemist (Dr. Doremus), after a most elaborate and praiseworthy examination, found traces of arsenic "sufficient to have produced death." This seems strong evidence, but is it sufficiently strong to justify the conclusions of the Coroner that "the fact of the poisoning is beyond all doubt," and that it "reduces our inquiry to the simple question, who administered the arsenic by which the death of Mrs. Sophia Stephens was undoubtedly occasioned?" Neither judicial sentence ought to be given, nor public opinion formed from, such authority as this, for the conclusions are merely assumed. Let us look at some of the facts.

First. Where is the physiological evidence that arsenic was the cause of death? There appears to be none, and it is certainly singular that this has been overlooked. It is well known that arsenic when taken in poisonous doses violently irritates and inflames the stomach; and so corroding is it that, if the patient lived a few days, the entire mucous membrane lining the stomach and intestines appears to be discharged *en masse*, the cellular tissue and muscular fiber also giving mournful evidence of its toxical power. This occurs whether the dose is vomited or retained. In the case before us, the patient did live several days, and, according to the evidence, took laudanum with the suspicious-looking powders, which would be the more apt to retain a larger quantity, while at the same time it would not prevent the destructive action of the poison. Yet Dr. Wood, one of the witnesses, on whose testimony the charge of the Coroner is founded, says, "The liver, stomach and intestines presented a well-preserved appearance, with a natural color."

Second. Even though a small quantity of arsenic was found in the body, the inference need not necessarily be drawn that it was administered as a poison. It is getting to be pretty well known that physicians are constantly receiving calls for arsenic, to be taken internally for roughness of skin, dusky and dull complexion, and a quantity is taken in this manner which the uninitiated know nothing of. The powders and washes of the face, the pimple destroyers, &c., owe their reputation mainly to the action of the arsenic they contain. This substance is also discovered so extensively in the mineral and vegetable world that but few bodies are found where it is really a foreign lodgment, and in spite of the opponents of Orfilia, or even some of his own concessions, it is undoubtedly true that arsenic (at least in some persons) is found tenanted in bones and even the muscles of those who have never taken the separate preparation.

Third. Very few would agree that the quantity of arsenic found in the body examined was sufficient to have caused death. Dunglison gives the remedial dose in one-eighth or one-tenth of a grain, and some have carried it as high as one, two and three grains. According to Professor Beck, in thirteen cases of poisoning by arsenic, the smallest quantity was 60 grains and the largest 120. Smaller doses than these may undoubtedly destroy life, but the quantity discovered in this body would hardly produce that effect. In an "analysis of the heart, lungs, liver, kidneys, large and small intestines, spleen, pancreas, omentum, bladder and uterus, only 0.185 grains of arsenious acid or about one-fifth of a grain was found." These are the most important organs in the system, and would of course contain the majority of the poison, yet the quantity of the acid is but little above the ordinary remedial dose.

We do not think it necessary that we should enter more fully upon this subject. We have thrown out a few thoughts, which may lead to such investigations and results as shall be useful not only for the cause of justice herein mentioned, but also for future reference in like cases.

Northern Lights—High Tides.

On the evening of the 27th ult. there appeared one of the most beautiful and remarkable aurora borealis ever witnessed in this latitude. Shortly after 7 o'clock, P. M., the northern sky was spanned with arches of pale green quivering light, traversed with numerous rays of the most brilliant red and purple colors, extending far over the heavens. The motions of these luminous rays were exceedingly rapid and graceful, well meriting the name of "merry dancers," applied to them by the natives of northern Europe. We have not witnessed such a splendid aurora since the month of January, 1838. During the week referred to, the northern lights appeared with different degrees of brilliancy every night, and in conjunction with these, the tides rose several feet higher on two successive days than had been the case for fifteen years. This took place several days after full moon, and at a period when very high tides are unusual. What could have been the cause of these wonderful natural phenomena? In the polar regions the aurora borealis is very common during the long dreary season when no light of the sun appears. In these countries of perpetual frost and snow, the brilliant red and orange colors of the aurora impart a cheerful warm glow to the chilling scenes of an Arctic winter.

Owing to the frequency of the northern lights near the poles of the earth, several eminent men of science believe they are caused by the polarization of light conjoined with magnetic influences. Dr. Dalton considered the aurora borealis as a magnetic phenomenon, and that its beams are governed by the earth's magnetism. Various experiments with light and magnetism give support to this theory. An arc of light produced between the poles of a powerful battery is deflected by a good magnet. If an electric spark from a machine is passed through a long glass cylinder nearly exhausted of air, a mimic representation of the northern lights takes place. Magnetic storms sometimes occur, and the needle has been observed to follow the shifting crown of an aurora. That part of the sky where the beams of light unite, is that to which the magnet is directed when suspended.

Sir William Snow Harris, an able writer on electricity, confidently classes the northern lights among meteors depending on ordinary electrical action, such as the flashing of electricity through rarified air at variable hights above the surface of the earth. He says: "By far the greater number of appearances occasionally observed in these latitudes and referred to the phenomena of the aurora borealis, may be traced to the presence of dense masses of electrical clouds yielding up electricity into the atmosphere above them. Both glow and brush discharges of electricity, infinitely varied and of vast extent, are produced in this way, and are often observed to proceed from behind masses of clouds in long shooting streamers, attended by a beautiful glow of diffuse light varying from green to deep purple, violet, and red."

Those who have visited the distant north speak in glowing terms of the brilliant aurora borealis which they had seen. The aurora there begins with bright pillars rushing back and forth with great velocity until they finally cover the whole sky. The streamers then meet in the zenith, spreading over and above the earth like a vast tent of glittering gold and crimson. Luminous corruscations also occur, accompanied with a rustling, crackling noise, similar to the sounds caused by electrical excitation in turning a large plate detached from the conductors of an electrical machine.

We have no intelligence in respect to any disturbances of the magnetic needle during the days of the 27th and 28th ult. If such took place, they would certainly afford not only strong proof of magnetic action in the production of the northern lights, also in affecting the tides of the sea.. This light has the appearance of luminous transparent vapor, and is usually followed by wind, rain, and unsettled matter. Luminous clouds of such a character were observed in the northwest sky in this locality on the evening of the 2d inst., and they were followed by a severe storm of rain and wind.

The Preservation of Stone.

Every one is of course aware of the part which the skeleton plays in the animal economy; it supports the softer parts of the fabric, and is, in fact, the framework upon which the rest of the body is built. In some animals, as man, this is internal, while in others—the shellfish—it is external. Remove from either type of life the skeleton, and observe what a seemingly unshapen mass it is, and how much more susceptible of decay. We use the above simply as an illustration, our real business being with inorganic nature, in the shape of rocks and stones, such as are fashioned into ornaments or blocks, and with which houses, palaces, city halls, and churches are built. These stones may be divided into two broad divisions, namely, those which have a siliceous skeleton, and these which have an aluminous or calcareous one, and be it further observed that this skeleton is not regular, and external or internal, but diffusive and permeating. It has been remarked that all those stones which have a silicious framework, such as granite, are firm, weatherproof and enduring, while those of the opposite character are not very tenacious, are easily worn by the weather, either crumbling gradually away, or shaling off, according to their nature, and last but a short time. Many illustrations might be found, but two will suffice.

The "Tombs" in this city is as good now as the day it was put up; while from the nature of the material and from the fact that there are seams and imperfections in the sandstone employed in St. George's Church (Dr. Tyng's), and in other buildings in this city, which will admit dampness and so disintegrate the stone, it becomes an important question, how to prevent this destruction of edifices constructed of friable materials. We are happy to say Mr. F. Ransome, of Ipswich, England, has done something towards a practical solution to this question. When a stone has no silicious skeleton to give it endurance against the winter's blast, he, with a philanthrophy that actually *feels for stones*, gives them an artificial one in the following manner. The outside of the building is first saturated with a sslution of chloride of calcium, and then several coats of soluble silicate of soda are laid on the outside of the building with a brush. Between these two substances a chemical action is set up in the very pores of the stone itself; the result being chloride of sodium (common salt) and sllicate of lime. The common salt washes out with the rain, but the silicate of lime remains in the stone, hardening as it grows older and protecting the building against the destructive action of the weather. Wood may also be rendered fire and weatherproof by this process, which is one that every builder should be acquainted with.

Machine for Printing Names on Newspaper Wrappers.

The *Artizan*, at Cincinnati, publishes an advertisement of F. A. McDowell, of that city, offering $10,000 for a "machine which will print addresses on newspapers and similar documents after they have been enveloped." An invention for this purpose has taxed the mind of many an ingenious inventor within the past few years, and many crude efforts have been projected to accomplish the result.

On the 7th of September last, a patent was secured through our Agency to James Lord, of Pawtucket, Mass., for an ingenious machine for this purpose. The claims and a notice of this invention appeared in No. 2 of this volume, Scientific American. Engravings of it are in course of preparation, and will soon appear in our columns. We also received a call, a few days ago, from Rev. J. Spencer, editor of the *Christian Guardian*, at Toronto, C. W. He claims that he has a machine which will print from 30 to 60 names per minute either on wrappers or the folded papers themselves, and so well satisfied is he that it will work that he is prepared to take orders for them. A machine of this character, to be useful, must of course be labor-saving; but it is hardly probable that it would be of much service except for journals of large circulation. Inventors, in order to think understandingly upon this subject, should make themselves familiar with the details of newspaper-wrapper writing in some large concern, else their ideas are liable to be very crude and ill-digested. They will also do well to examine what has been already done in this line of invention.

More Steam Fire Engines.

We learn from the Philadelphia *Ledger* that there are now three steam fire engines in use in that city, and three more are being built. One of these, for the Hibernia Company, will be capable of throwing a stream, through a 1¼ inch nozzle, to a distance of 251 feet. We are right glad to hear of the success of the steam fire engine, as there is thus presented a way of escape from the disgraceful system at present in vogue in this city. Many of our firemen, no doubt, are excellent men, but they are too often attended by vagabond runners, thieves, and villains, who destroy more property than they save.

A New Rule—The Commissioner of Patents has revived the old practice of requiring all applicants for patents to sign their drawings. Judge Mason attempted the same thing; finding, however, that it served no useful purpose, but on the contrary, operated badly, he abandoned it, much to the satisfaction of all parties connected with the office. We hope Commissioner Holt will do likewise.

We understand, from good authority, that Commisioner Holt will not resign his present position; we rejoice to hear this good news.

Resignation.—We regret very much to announce the resignation of Thos. H. Dodge, Esq., late a Chief Examiner in the Patent Office, and Chairman of the Board of Appeals. Mr. Dodge has been a most valuable and efficient officer, and has had the full confidence of the Commissioner, Mr. Holt. He returns to the practice of his profession—the law; and we have no doubt he will soon find his time fully occupied in the various important patent cases, which, from time to time, come before the United States Courts.

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The Necessity of Ventilation and Fresh Air.

We had intended to write, in simple language, an appeal for more fresh air in our lecture rooms, churches, and public buildings. Incidentally, however, an esteemed clerical friend in this city, who has himself been "a gasper," handed us the following, which, when backed up by his assertion "that by a course of logical argument he considered it demonstrable that fresh air and ventilation, under certain circumstances, were positive means of grace," we at once decided, upon the weight of his authority, to insert it without offering any remarks of our own. It is credited to the Detroit *Tribune*, and although the orthography is not exactly Websterian, yet we think it is intelligible, and have no desire to spoil the purity of its expression by a translation into the vernacular.

A APPEAL FOR ARE TO THE SEXTANT OF THE OLD BRICK MEETINOUSE.

BY A GASPER.

O sextant of the meetinouse, wich sweeps
And dusts, or is suposed too! and makes fiers,
And lites the gass, and sumtimes leaves a screw loose
in wich case it smells orful—worse than lam-pile;
And wrings the Bel and toles it when men dyes
to the grief of survivin pardners, and sweeps pathes
And for the servases gits $100 per annum,
Wich them that thinks deer, let em try it;
Getin up befoar star-lite in all wethers and
Kindlin fiers when the wether is as cold
As zero, and like as not grean wood for kindlers
i would'nt be hired to do it for no some—
But o sextant! there are 1 kermoddity
Wich's more than gold, wich doant cost nothin,
Worth more than anything exsep the Sole of Mann
i mean pewer Are, sextant, i mene pewer Are!
O it is plenty out o dores, so plenty it doant no
What on airth to dew with itself, but flys about
Scatering leavs and bloin of men's hatts;
in short, its jest "fre as are" out dores.
But o sextant, in our church its scarce as piety,
scarce as bank bills wen agints beg for mischuns,
Wich some say is purty often (tsint nothin to me,
Wat i give aint nothin to nobody); but o sextant
u shet 500 men, wimmen and children,
Speshally the latter, up in a tite place,
Some has bad breths, none aint 2 swete,
Some is fevery, some is scrofilus, some has bad teath,
And some haint none, and some aint over cleen;
But every 1 on em breethes in & out and out and in,
Say 50 times a minit, or 1 million and a half breths an our.
Now how long will a church-ful of are last at that rate,
i ask you, say 15 minits, and then wats to be did?
Why then they must brethe it all over agin,
And then agin, and so on, till each has took it down
At least 10 times, and let it up agin, and wats more
The same individible dont have the priveledge
of breethen his own are, and no ones else;
Each one mus take whatever comes to him.
O sextant, doant you no our lungs is bellusses,
To blo the fier of life, and keep it from
goin out: and how can bellusses blo without wind
And aint wind *are?* i put it to your conschens.
Are is the same to us as milk to babies,
Or water is to fish, or pendlums to clox,
Or roots and airbs unto an injun Doctor,
Or little pils unto an omepath,
Or boys to gurls. Are is for us to breethe.
Wat signifies who preeches if i cant breethe?
Wats Pol? Wats Pollus? to sinners who are ded?
Ded for want of breth? why sextant, when we dye
Its only coz we cant breethe no more—thats all.
And now, o sextant, let me beg of you
2 let a little are into our church.
(Pewer are is sertin proper for the pews)
And do it weak days and Sundays tew.
it aint much trouble—only make a hole
And the are will cum in of itself
(it luvs to cum in whare it can git warm);
And o how it will rouze the people up,
And sperrit up the preecher, and stop garps,
And yawns and figgits as effectooal
As wind on the dry Boans the Proffit tells of.

Iron Girders.—No. 3.

But what forms and what construction do the forces require? This question is not easily determined by experiments on imperfect forms. The way to obtain correct ideas of what is required is, to divest the mind first of all that has been said about forms, and even of the existance of a *beam*, and to regard a load as a force acting vertically over an open space, and with a view of changing its direction, so as to concentrate the action wholly in two points just outside of this open space. It must also be observed that this result is to be accomplished within a given hight, and in the most simple and economical manner. The mind thus being freed from false theories and confused ideas will be able to analyze all the forces in play with as much certainty as the movements of the planets are now calculated, and there will be no difficulty in devising forms suited to all the conditions and requirements of the question. To do this, the magnitude of the force or forces representing the load and the manner of its application, whether concentrated or diffused, must be known. The width of space between the points to which the forces are to be directed, and on which their action is to be concentrated, also the vertical hight between these points of concentration and the points of application, must be known. Having these elements of calculation clearly before us, it will be comparatively easy to determine and trace axes of equilibrium that shall truly represent the sums and direction of the resultants of all the forces, and which will also indicate the form of construction required to sustain all the forces in equilibrio.

To illustrate this point, suppose the load to be represented by a weight of thirty tuns acting vertically on one point, as on the middle of the upper side of a beam, and it is desired to transfer the vertical action of the weight to two other points in a plain five feet lower, such as to bearing under the ends of a beam, and that these bearings are in a horizontal plane, and sixty feet apart from each other, as in a span of sixty feet—the vertical hight between the plane in which these bearings are situated, and the point of application of the weight being regarded as the depth of the beam. Or suppose that it is desired to accomplish this transfer by means of a beam five feet in depth, and of sixty feet span of the best form. Now, whatever the form may be of the beam, or medium by means of which the pressure of the weight is to be transferred from the point of its application to the bearings, the normal direction or axis of all the forces resulting from the weight will, in this case, be in two straight lines, extending from the point of application to the bearings, and the strain resulting from the weight will be nearly equal at all points within the lengths of these lines, which in this case (weight of structure not included) will be about equal to three times the weight, or ninety tuns. Therefore the most economical form of structure by means of which the vertical pressure of the weight can be conducted to the bearings will be (theoretically) two straight pieces of material, their centers coinciding with the oblique lines or axes of the forces, and each extending in opposite directions from the point of application to the bearings, each being capable of sustaining a pressure at all points of its length of about (in round numbers) ninety tuns. The horizontal thrust at each of the bearings due from the weight will also be about ninety tuns. This may be counteracted by means of abutting resistance, or of a horizontal tie of ninety tuns tensive capacity connecting the lower ends of the oblique thrust pieces. This tie, then, and the two thrust pieces, will form a triangular structure with a base or clear span of sixty feet and a hight of five feet, which is all, theoretically, that is required. Practically, however, the oblique thrust pieces will require a slight addition of depth or strength on their upper sides, to prevent downward deflection from their own weight, and the horizontal tie will require some support to hold it in a straight line.

Such a structure seems to be precisely what is required to provide for all the conditions arising, and to be formed in the most economical manner. The parts are so arranged as to be acted upon only in the direction of their length, and will not be subjected to cross strains.

If these views are right, then the horizontal theory must be wrong, for in this the forces can act horizontally only in the tie and at the vertex, where the weight is applied—there is no place within the depth of the structure for a neutral axis. Every possible line that can be drawn horizontally between the base and vertex, and extending through the length of the structure must not only sustain vertical pressure equal to the weight of thirty tuns, and this will act in every possible horizontal section within the lengths of the oblique thrust pieces. And the case will be essentially the same in a beam uniformly loaded, except the form of the upper chord; this, when made to correspond with the axis of the compressive forces resulting from a uniform load, will be curved in the form of an arch, slightly at the middle, but gradually increasing in curvature towards the ends, until the upper and lower chords meet on the centers of the bearings, and the forces acting through the chords will result in the vertical pressures on the bearings.

BENJAMIN SEVERSON.

Baltimore, Md., October, 1858.

Interesting Notes on the Reaping Machine.

Like many other valuable inventions, says the *Mark Lane Express*, the reaping machine was at first announced to an age that did not want it; and when at last the inadequacy of the old methods to meet modern requirements created a demand, it was revived as a novel wonder both in Great Britain and the go-head country at the other end of the Atlantic "cable." It is not generally known that, as long ago as the year 1780, the Society of Arts proposed the gold medal, or £30, as a premium for "a machine to answer the purpose of mowing or reaping wheat, rye, barley, oats, or beans, by which it might be done more expediously, and cheaper than by any methods then practised, provided that it did not shed the corn or pulse more than the methods in common practice, and that it laid the straw in such manner as might be easily gathered up for binding." Here was an admirable conception of the work required to be done, but too much for inventors to attempt all at once. So that, as Pliny and Palladius had described the Roman reaping machine, pushed by an ox, and combing off the ears by means of teeth on the front, Mr. Pitt, of Pendeford, designed an improvement upon it in the year 1786, namely, a "rippling" cylinder with iron teeth, driven by the carriage wheel. In 1793, a reaping machine was contrived in Lincolnshire; and in November of that year, Mr. John Cartwright, of Brothertoft, near Boston, England, published the fact of his having invented a reaper "acting upon a different principle to one previously constructed by himself." In the same year, Mr. Edmund Cartwright, of Doncaster, advertised his "machinery for reaping or mowing corn, grass, &c., which, by means of one horse and a driver, will cut down six or eight acres of standing corn in a day. It is his intention as soon as one hundred machines are engaged for, to establish a manufactory of them; the price of each machine will be twenty guineas." The purchasers might return the machines if the invention failed to obtain the "previous seal of approbation" of the Board of Agriculture. These antiquarian items of harvesting machines are interesting when we bear in mind their very early date—long before Boyce's patent for revolving scythes (not exactly like those with which Boadicea performed the anti-Cæsarian operation of slashing down Roman invaders)—before the improvements of Plucknet and Gladstone; long before Salmon's clipping shears, or Smith of Deanston's rotary disk and delivery-drum.

The same high authority quoted above gives great credit to American inventors for effecting the introduction of the mower and reaper into the heavy cropped fields of grain.

Crosskill, Dray, Burgess & Key, and other English manufacturers, have, however, incurred great expense in practically testing these machines; still the ingenuity of the American brother Saxons is the source from which new arrivals of improvement are continually forthcoming, so that a common piece of gossip now-a-days is about Messrs. So-and-so's new Yankee grass mower or corn reaper.

We learn also that Mr. B. Samuelson, of Banbury, England, has recently introduced into that country the machine of Messrs. Seymour & Morgan, Brockport, N. Y. Its operation has proved satisfactory, especially the mode of delivering the grain in sheaves instead of swaths.

We are always happy to chronicle the success of our inventors, and particularly so when their ingenuity is matched against that of a people so thoroughly skilled as the English.

Sir Isaac Newton's Taste for Farming.

When Newton had reached his fifteenth year, he was called from the school at Grantham to take charge of his mother's farm. He was thus frequently sent to Grantham market, says Timbs, to dispose of grain and other agricultural produce, which however, he generally left to an old farm servant who accompanied him, and Newton made his way to the garret of the house in which he had lived, to amuse himself with a parcel of old books left there; and afterwards he would entrench himself on the wayside between Woolsthorpe and Grantham, devouring some favorite author till his companion's return from market. And when his mother sent him into the fields to watch the sheep and cattle; he would perch himself under a tree with a book in his hand, or shape models with his knife, or watch the movements of an undershot water-wheel. One of the earliest scientific experiments which Newton made was in 1658, on the day of the great storm, when Cromwell died, and when he himself had just entered his sixteenth year. Newton's mother was now convinced that her son was not destined to be a farmer; and this, with his uncle finding him under a hedge, occupied in the solution of a mathematical problem, led to his being again sent to Grantham School, and then to Trinity College, Cambridge, which thence became the real birthplace of Newton's genius.

The Solar Eclipse.

It will be recollected that our government sent out Lieut. Gillis to take observations of the solar eclipse which was total in some parts of South America on the 6th of last month. He has written a brief letter on the subject to Professor Henry, of the Smithsonian Institute, in which he states that his telescope was mounted near Olmos, in Peru, and his observations were favorable. The usual rose-colored corona attendant on total eclipses was observed rising over the moon's disk, and was very beautiful. The brilliant protuberances usually observed with instruments, shooting from the sun's disk, were also visible, and on this occasion became distinct to the naked eye. These phenomena, witnessed during total eclipses, are supposed to indicate violent action of fire in the sun.

How to get Subscribers.

MESSRS. EDITORS—Enclosed I send you a list of twenty subscribers, with $28. I was only half a day getting them, which I think time well spent. I shall be called to different points in the State this year, and I will try to enlarge the list. I am indebted to the SCIENTIFIC AMERICAN for my present business. I secured a patent right which was advertised in your paper, and am now doing well. Every mechanic would do well by taking your paper. E. G. SMITH.

Auburn, Cal., October, 1858.

[We publish this letter in order to show, in the first place, how easy it is for our friends in some localities to form a club of subscribers for the SCIENTIFIC AMERICAN; in the second place as a specimen of many letters which we receive from persons who date the commencement of their prosperity from some suggestion that they found in our columns, or from having their inventions illustrated in our pages; and lastly, to thank Mr. Smith for his exertions in our behalf, and to assure him that if he never spends a half a day more unprofitable to himself, his friends, and us, we think his life will be a path of roses. Also that others of our readers and friends may profit by his example, and endeavor to do likewise.—EDS.

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Notes and Queries

*** PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

TWENTY-two patents in the official list published on another page are cases which were prepared at the Scientific American Patent Agency, 128 Fulton street, New York, exclusive of any that may have been secured through the Branch Office of MUNN & CO., located opposite the Patent Office, Washington, D. C.

J. T. F., of Box 485, Detroit, Mich., wishes to know where he can obtain a set of globe valve patterns complete either new or second-hand.

E. T., of N. C.—A pendulum has never been employed as a motive regulator, economically, except for clocks. There is no power in a pendulum itself, it only regulates the releasing of a spring in which the power is stored. It was once attempted to propel a boat in this city by a pendulum, but it was a complete failure.

A. C. C., of Ohio, J. G., of Wis., E. R., of Mass., D. C., of Pa., and E. E., of N. Y.—We find, upon an examination of your rejected cases, that the papers were very clumsily prepared, and before we can hope for success, the cases must be presented under new applications. We think your claims will not be rejected upon such claims as we should set up. You now see the disadvantages of employing incompetent and inexperienced agents.

J. G. H., of Fla.—You do not state what kinds of wood you intend to use for getting out shingles; but in reference to a machine, we advise you to write to James D. Johnson, of Bridgeport, Conn. He has the control of Woods' recent patent, which is considered an excellent machine by those who have tried it.

L. O. C., of ——.—We do not think you could obtain a patent. Your invention is too much like the admission of air through openings in top of the fire bridge of a boiler furnace, which is an old contrivance. We should have written to you, but did not know how to address a letter.

IRON GIRDERS—This subject will be completed in our next number. The information contained in these articles is very useful.

J. C., of Conn.—We have placed your letter on file for future reference.

A CURIOUS FACT—There is iron enough in the blood of 42 men to make a plowshare weighing about 24 pounds.

A GOOD IDEA—The pediment over the entrance to a workhouse in London, has been decorated with an ideal figure of an old man holding and pointing to a piece of drapery on which is inscribed the motto, "Avoid idleness and intemperance." It is to be hoped that the advice will be largely taken.

F. J. S., of Fla.—Rye grass has been supposed to give paralysis to horses, that is, when too much is mixed with their feed. A change of food into bran mashes and oats, to improve the "condition" for a few days, is, perhaps, the best cure you can adopt.

A MUSEUM is to be established at Athens for the reception of Grecian antiquities.

AN INTERESTED PARTY writing from Pittsburg, Pa., objects to our position that "patent rights can be attached." We refer him to the letter of George Gifford, Esq., on this subject, page 371, Vol. VII, SCI. AM. This authority places the matter beyond question in our judgment.

A CURIOSITY—The engraving which accompanies this, is, without exception, the finest specimen of wood-engraving we have ever seen. It is the Lord's Prayer complete, in a circle of 3/8ths of an inch in diameter. The designer and engraver is Mr. W. Caughey, of this city, who cuts many of the beautiful illustrations published in the SCIENTIFIC AMERICAN.

H. C., of Boston.—The bobbin-net machine for making cotton lace was invented in 1809, by John Heathcote, of Tiverton, England. Its introduction led to serious riots, which continued at intervals for a space of five years, and were not put down until many who took part in them atoned for their outrages with their lives. The machine was very complex at first—one single hole in the fabric now completed by six motions then requiring sixty. In 1815, one square yard of net was worth $7 50, the same quantity being now attainable for about 6 cents. The Jacquard machine was not applied to this business till 1839.

C. F. H., of Pa.—Hard varnish for wood is made by dissolving stick-lac in alcohol. It dries rapidly, and you can put on several coats.

H. L. P., of N. Y.—It has already been suggested in our columns that warm currents of water may be a cause of injuring the Atlantic cable. A cable formed of glass tubes never could be laid in the Atlantic; the tubes would be crushed to powder on the reels.

J. C., of L. I.—If you can obtain a piece of the meteoric stone found at Huntington, we advise you to send it free of expense to Dr. Lawrence Smith, at Louisville, Ky., for analysis.

P. S., of Ky.—We are unacquainted with the alleged discovery in fermentation, said to have been made in France, whereby a greater yield of spirits is claimed to be obtained from grain in distillation.

J. S. W., of Cal.—We do not know the composition of the yeast powders to which you refer. Effervescing powder for self-raising flour is composed of ground tartaric acid and bi-carbonate of soda. Dana's Manual of Mineralogy is published by Durrie & Peck, New Haven, Conn., and Smee's Electro-Metalurgy, by Wiley & Halsted, of this city.

J. L. B., of N. J.—Balloonists employ sand for ballast because it is the most convenient, and when they throw it out it falls in a shower. It would not be possible to make receivers of condensed gas for ballast. We have seen a balloon with a steering apparatus, but it was of no benefit. We think the fabric described in your letter is patentable.

W. H. Ward, of Lexington, Ga., wishes to procure the best mill for grinding bones for agricultural purposes.

Money received at the Scientific American Office on account of Patent Office business, for the two weeks ending Saturday, November 6, 1858 :—

O. L., of N. Y., $55; W. W. H., of Ohio, $30; C. W., of N. H., $15; G. W., of N. Y., $25; C. L. R., of Conn., $30; B. I., of Ill., $30; N. P., of Ind., $20; O. E. W., of Pa., $55; D. R., of Pa., $30; W. M. W., of Ind., $30; J. G., of Pa., $30; C. V. L., of Texas, $35; M. & D., of Mich., $400; H. H. P., of N. Y., $25; H. B., of Va., $30; L. R. S., of Mich., $20; G. K., of N. H., $37; J. B. A., of N. Y., $75; H. B. T., of Wis., $30; W. S. W., of L. I., $15; A. L. B., of Vt., $25; D. W., of Mass., $30; C. A. B., of N. Y., $30; H. A. R., of N. Y., $30; J. L. W., of N. Y., $30; J. H. I., of Ill., $25; N. D., of N. J., $25; T. R. Van G., of Pa., $30; T. B., of N. Y., $30; J. C., Jr., of N. H., $12; R. G., of Md., $60; J. G., of Ga., $25; G. & I. C., of Pa., $30; E. M. W., of Pa., $25; C. W., of N. J., $80; J. C. H., of Miss., $25; H. T., of N. Y., $25; J. R. W., of N. Y., $275; A. H., of L. I., $30; J. Y., of Pa., $50; A. K., of N. Y., $100; O. W. S., of Conn., $55; G. W. F., of Mass., $15; S. B., of N. J., $30; J. W. R., of N. Y., $30; C. B. R., of Conn., $30; A. B., of N. Y., $30; W. G. B., of Ill., $25; G. H. G., of N. Y., $30; G. F. J., of L. I., $30; F. C. K., of Wis., $30; C. A. E., of Ga., $25; E. M., of N. Y., $25; J. B., of N. Y., 30; T. T., of Ohio, $30; M. C., of Mass., $57; J. B., of N. Y., $60; E. K., of N. J., $30; J. P., of Ind., $25; S. K. B., of Ill., $30; C. C., of Ind., $5; J. H. T., of N. Y., $55; W. L. M., of Ga., $25; P. B., of N. Y., $30; N. P., of Pa., $25; T. N., of Tenn., $20; L. & M., of Ill., $10; E. A. P., of Mich., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the two weeks ending Saturday, Nov. 6, 1858 :—

F. & I., of Pa.; E. M., of N. Y.; J. B. A., of N. Y., 3 cases; C. C. B., of Wis.; M. C., of Mass.; G. W. F., of Mass.; J. C. H., of Miss.; W. S. W., of L. I.; N. P., of Pa.; C. W., of N. H.; A. L. B., of Vt.; G. W., of N. Y.; W. L. M., of Ga.; H. T., of N. Y.; E. A. P., of Mich.; J. W. S., of Ohio: O. L., of N. Y.; H. H. P., of N. Y.; J. G., of Ga.; J. H T., of N. Y.; T. B., of N. Y.; C. A. E., of Ga.; E. M. W., of Pa.; G. K., of N. H.

Literary Notices.

ISABELLA ORSINI. By F. D. Guerrazzi. New York: Rudd & Carleton, 310 Broadway. This is an admirable work of fiction by the talented author of "Beatrice Cenci," and is translated from the Italian by Luigi Monti, A. M., Instructor in Italian at Harvard University. There is a value in works of this kind beyond the mere enjoyment of the romance, from the amount of history they contain, and this author is especially happy in blending with the narrative of the story the history of the old families of Italy, when she was in all her state and glory, and the Medici and Orsini flourished in their glories, art, conquest and song. Of the book itself we have only space to say that it is a perfect picture of the life of one of the most noted heroines of a family of heroes, and its value is greatly enhanced by a portrait of the heroine engraved by F. Halpin, of this city, in which he has done full justice to her most intelligent face.

BLACKWOOD'S MAGAZINE.—Published by L. Scott & Co., No. 54 Gold street, New York.—The number for this month of the above able monthly is very attractive. The story, by Bulwer, "What will he do with it?" approaches its climax, and deepens in interest. An essay on "Animal Heat" exhibits profound views of the whole subject. Several other articles—especially the one on the Campaign of Sir Colin Campbell in India—are writtten with evident ability.

[Advertisement.]

SEWING MACHINES.—A reduction in the prices of Sewing Machines is announced in our advertising columns. We have heretofore expressed the opinion that the prices of this invention have been too high—so high as to place them beyond the reach of many whom they would most benefit. Their utility is established beyond question, and at the present prices we see no reason why they should not be found, as they ought to be, in every household. Several varieties are manufactured, adapted to various purposes. So far as public opinion has been formed and uttered, the preference is emphatically accorded to the WHEELER & WILSON machine for family use, and for manufactures in the same range of purpose and material. During the present autumn the trials have been numerous, and all the patents of any pretension have been brought fairly into competition. In every case, the WHEELER & WILSON machine has won the highest premium. We may instance the State fairs of New Jersey, Pennsylvania, Kentucky, Illinois, Wisconsin and California, and the fairs of the Cincinnati, Detroit, Chicago, and St. Louis Institutes, already held. At the fair of the St. Louis Mechanical Association, the committee consisted of twenty-five ladies of the highest social standing, who, without a dissenting voice, awarded for the WHEELER & WILSON machine the highest and only premium—a silver pitcher valued at $75. If these facts do not establish a reputation, we know not what can.—*Christian Advocate and Journal.*

AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other agency in the world. The long experience we have had in preparing specifications and drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between nine and four o'clock, daily, at their principal office. 128 Fulton street, New York. We established, over a year ago, a Branch Office in the City of Washington, on the corner of F and Seventh streets, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery Lane, London; 29 Boulevard St Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European patents secured to American citizens are procured through our Agency.

Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the principal office or either of the branches.

The annexed letter from the late Commissioner of Patents we commend to the perusal of all persons interested in obtaining patents :—

MESSRS. MUNN & CO.—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers.

Yours, very truly, CHAS. MASON.

Communications and remittances should be addressed to MUNN & COMPANY,
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FOR SALE—SECOND-HAND MACHINISTS' TOOLS—One large boring mill for car wheels, weight, 4,000 lbs.; cost $600—price, $250. One large boring mill (English) for car wheels, weight, 2,000 lbs.; cost $400—price, $100. One screw lathe, 8 feet bed, 20 inch. swing, weight, $1,500 lbs.; cost $350—price, $150. Also one 10 ft. planer; cost $850—price, $550. Apply to GEO. S. LINCOLN & CO.,
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THE BLANCHARD PATENT STEAM BOILER generates steam more economically than any process ever before used. A steamboat with this boiler is daily running on the Hudson, carrying passengers and freight. The fire being kindled, when the boat starts the chimney is closed. No smoke, no sparks, no cinders escape, the combustion being perfect. A Blanchard boiler, of half the size, with half the water, and less than half the fuel, generates the same amount of steam as an ordinary boiler. Its construction is not unlike others, its cost about the same. The fire chamber is simple, but in this is found the source of the great gain. It is applicable wherever steam power is needed, and especially on locomotives and canal steamers, where it is desirable to dispense with a chimney. For further particulars, price, rights to make and use, &c., address F. B. BLANCHARD, Box 2,454, Post-office, New York. 10 2

FOR SALE—I WILL SELL FOR $5,000 A PATENT right that is worth $50,000. For information address WILLIAM RANDLE, Florida, N. Y. 10 2*

NOTICE.—JOHN FOWLER, FORMERLY OF New York, assignee of Henry Jones' patent for Self-raising Flour, may learn something to his advantage by addressing PROF. CHARLES G. PAGE, Washington, D. C. 10 3

BOILER SCALE EFFECTUALLY OBVIATED by Weissenborn's Patent Incrustation Preventer, which is also a superior water-heater and condenser. For particulars and list of reduced prices, apply to STEWART KERR (Engineer),
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HOLLELY'S SELF-ACTING BLOWPIPE The best Blowpipe in use for Jewelers, Dentists, Chemists, and Silversmiths. See description in SCI. AM. for October 2d, 1858. Sent to any part of the United States on receipt of price—$8. J. HOLLELY,
9 2* No. 25 Furman st., Brooklyn, L. I.

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SOMETHING ENTIRELY NEW—SHELL'S Virginia Roach Trap. Patented October 5, 1858. The only trap ever invented that will effectually get rid of these nuisances. Every family in the land are bound to have them. Sell readily—over 3,000 were sold in this city in one month, the past summer. The subscribers having purchased the whole right for the United States, are now prepared to sell State, county, or shop rights. They also want to employ a number of energetic and responsible men to act as agents, principally for the Southern States. To the right kind of men we will offer liberal inducements. Having a large force employed in manufacturing, we are enabled to supply parties with these traps in any quantity at short notice. Address WM. SEARS WOOD & THOMAS N. SHELL, Assignees, Richmond, Va. 9 3*

JOHN PARSHLEY, SUPERINTENDENT, Urbana, Champaign County, Ohio, is now finishing twelve Steam Engines of 10-inch bore and 20-inch stroke, on cast iron beds, with metallic spring packing in cylinder, with throttle and governor valve, 6-feet balance wheel, 13-inch face (turned); with lift and force pump. These engines, in all of their working parts, are as good workmanship as the best high-finished engines built in the United States, and are warranted to do as much work, and with as little fuel as any other make of the same bore and stroke, and require much less care. Price at the shop, $400, cash. The expense of delivering in New York is from $25 to $30. Other sized engines, from 20 to 100-horse power, built to order, as also all kinds of machinery for flouring and saw mills and distilleries. For further particulars address as above. 8 4*eow

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made by this Machine. This is the only stitch that cannot be raveled, and that presents the same appearance upon each side of the seam. It is made with two threads, one upon each side of the fabric, and interlocked in the center of it. Send for a circular. 6 tf

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CLAY RETORTS—THOS. HOADLEY, patentee of the Patent Pyro-clay Gas Retorts—manufactory Nos. 32 and 34 Front st., Cleveland, O. 9 12*

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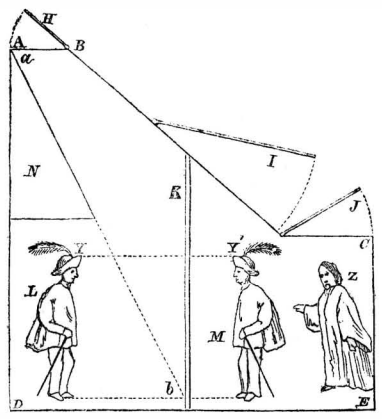
Science and Art.

A New Optical Illusion.

H. Dircks, Esq., in a paper communicated to the British Association, introduces a novel apparatus by which a sheet of plane plate glass is made to act as a mirror, and by whose powers many-seemingly spectral illusions can be obtained. Its chief use will be as an adjunct to the stage, but as a home toy it will almost afford as much fun and wonderment as the magic lantern.

The arrangement of the apparatus is represented by the annexed diagram. A B C D E is a box closed on all sides, but provided on two sides with small doors, and on the top of the box are the flapped openings, H I J. The



interior of the box is divided centrally by the partition, K K, made of a good, clear, and even-surfaced piece of thin patent plate glass, kept in its place within two side grooves. The box is thereby divided into two separate chambers or compartments, L M, the former, L, having a ceiling or screen, N, to exclude any object therein from the direct view of the spectator, as shown by the line, *a b*.

If two figures be now introduced, one Y, the other, Z, and the eye of the spectator be fixed at A, he will observe two images, one the real figure Y, the other Y′, the mere reflection of Y. By this arrangement it is evident that the plain unsilvered glass thus viewed at an angle of about 45° has all the properties of a mirror, but, owing to its transparency, two figures are seen possessing little or no distinguishable difference between them. Of course a person placed at Z sees only the figure Y; but as a piece of acting he may, under proper arrangements of a suitable stage, approach the situation apparently occupied by Y′, and thus indicate to spectators placed at A any pre-arranged dramatic scene requiring Z to be in correspondence with the visionary figure, Y′.

In using the apparatus, the flap, H, must be open, but I may be shut, being mostly useful to get admission for inserting or withdrawing the screen or the figures. The flap, J, may be closed or opened to regulate the admission or exclusion of light. The two doors at the sides may both be wide open, though one is generally sufficient, provided it is turned as direct as possible to the light. A mirror placed at an angle close to the side doors will assist the illusion by illuminating the figure, Y, and thus hightening the effect of the reflection, Y′.

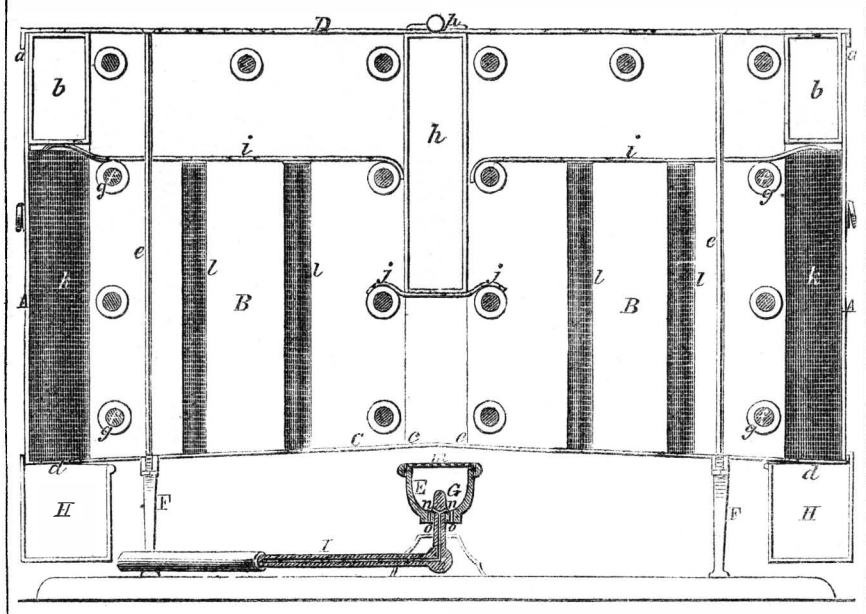
Some of our ingenious juvenile readers should set to work and construct one of these apparatuses, and see how it works.

Improved Radiator.

Stove-fixing time is now upon us, and every one is discussing the question, "How shall I warm my room or store or office economically?" Gas and alcohol, although not by first cost the cheapest heaters, yet when their superior cleanliness and ease of management (thus saving labor) are taken into consideration, the expense greatly diminishes, so much so, indeed, that in many places and situations they are far preferable to wood or coal. There is, however, one objection to which they are both liable, and that is, the moisture produced by their combustion renders the atmosphere unhealthy, but by the improved radiator the moisture is entirely condensed and the carbonic acid is also absorbed by the water of condensation so that no chimney is required, and gas or alcohol is made as healthy and convenient a heating material as any other.

A B C D is the outer shell composed of two parallel metal plate walls, having circular enlargements, A A, at each end and in the center. The space between the sides, B, is very narrow, generally about an inch. The top and bottom, C D, may be of cast iron, the sides being fitted into rims, *a*, and secured by screw bolts, *e*, passing through the radiator. The sides are stayed by rivets and collars, *f g*. In the center of the bottom is an opening, *c c*, the full size of the center enlargement, and under this the burner, E, is placed, and under each other enlargement there is an opening, *d d*, in the bottom, which slightly slants towards them. F F are feet on which the radiator stands. In the ends, metal cylinders, *b*, are fitted tight, and in the center is a similar but deeper metal cylinder, *h*. Between these are horizontal deflectors, *i*, of metal, and a similar deflector, *j*, is placed under *h*. These do not entirely shut off the upper part of the radiator, but prevent it from becoming too highly heated by the too free circulation of the flame and heated products of combustion; the cylinders, *h b b*, also prevent a dangerous accumulation of gas in the radiator should the burner by accident be turned on and not lighted. The lower parts of the end enlargements contain cylinders, *k k*, of wire gauze and smaller gauze cylinders, *l l*, are fitted between the flat sides, and these cylinders, *l* and *k*, aid the deflectors in distributing the heated products of combustion. There is a register, *p*, in the top plate, by which the steam evolved during combustion may be allowed to escape into the room in small quantities when the air requires it. H H are vessels suspended under the holes, *d*, to catch the condensed water that escapes from them. The burner consists of a box with its top composed of wire gauze, *m*, about the same size as the opening, *c c*, with a jet nozzle, G, in its bottom, in which are a number of holes, *n*, for the issue of the gas. A number of holes, *o o*, admit air into the burner, and when the air and gas are thoroughly mixed, they burn on the wire gauze, *m*. I is the pipe that conveys the gas to the burner.

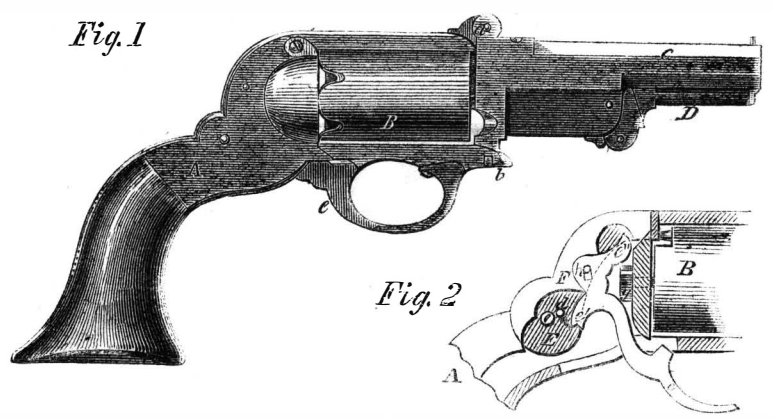
CHESTER'S RADIATOR.



The operation is as follows:—The flame and heated gaseous products of combustion entering the radiator from the burner strike the deflectors, *j j* and *i*, and are spread in opposite directions, and the gases are caused to circulate between the sides of the radiator and through the wire gauze cylinders *l l*, yielding their heat as they pass, and leaving much of the water condensed upon the surfaces before they arrive at the cooler parts of the radiator, namely, the end enlargements, upon the surfaces of which and upon the cylinders, *k k*, the condensation is completed as the final absorption of heat takes place. The water trickles down to the holes, *d d*, and from that passes into the vessels, H H, as from the direction of the incline it cannot accumulate around the burner, where it would be likely again to evaporate.

This compact and excellent radiator is the invention of I. H. Chester, of 272 Sixth street, Cincinnati, Ohio, who will be happy to furnish any further information. It was patented July 13, 1858.

NEWBURY'S REVOLVER.



We are told by the most sound of social philosophers that the more certainly fatal we render war, the nearer we approach that "consummation, devoutly to be wished," universal peace, and from this point of view, which certainly has historic evidence to support it, every improver of firearms is a true philanthropist. Indeed, if we trace the history of war, we find that the discovery of gunpowder at once elevated it from being a mere test of physical or brute force to a science and an art, and now the victory is not with the strong, but with the intelligent. Perhaps nothing will tend to confirm the certainty of death in war, and so insure the conquest for the most progressive nation as the introduction of the revolver, by which the first charge of a battle will be rendered so deadly that few will be got to oppose the army provided with them, while at the same time as a weapon of self-defense the revolver is unequaled. The numbers of these weapons now in use prove their efficiency, but the majority are complicated in their construction, and very difficult to repair when they once get out of order.

The subject of our illustration is free from both these objections, being simple, and can be repaired by any blacksmith who can temper a piece of steel.

Fig. 1 is a perspective view of the pistol, A being the wrist and stock, B the chambered breech, C the barrel, and D the lever, that operates the ramrod. The barrel is hinged to the breech frame by a pivot, *a*, being kept in position by a spring catch, *b*, which being released, the barrel can be raised and the chambered breech taken out to be cleaned or for other purposes; *e* is the trigger, which is of the shape shown by Fig. 2 that shows the arrangement of the lock. The trigger has a slot, *h*, in it, through which passes a pin secured to the piece, F, that forms part of the wrist. As the trigger is pulled back, the pawl-shaped projection, *e″*, catching the ratchet wheel, *g*, on the axis of the chambered breech, revolves it in one chamber, and at the same time the rounded part of the trigger near *e′*, moving against the pin, *d*, on the hammer, E, elevates it until the pin, *d*, falls into the angular groove, *e′*, by which it is securely held cocked. When it is desired to fire, the trigger is pulled a little further; *d* is released from the notch, and the main spring brings the hammer down. The trigger in coming back to its original position slides up the pin by means of the slot, *h*, so that the groove and projection, *e′*, pass over the pin, *d*, without obstruction. When it is desired to fire the piece quickly, it is only necessary to pull the trigger promptly beyond the cocking point. The simplicity of the lock is at once evident, there being in it only a hammer, trigger, main and sere springs, and the force required to operate it is very small.

It is the invention of F. B. Newbury, of Albany, N. Y., and was patented June 29, 1858, and any further information can be obtained by addressing the agent and assignee, R. V. Dewitt, of the same place,

INVENTORS, MILLWRIGHTS. FARMERS AND MANUFACTURERS.

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